JOB COMPLETION REPORT
INVESTIGATIONS PROJECT

State Montana Name Wildlife Investigations, District Two

Project No. W-72-R-9 Title Big Game Surveys and Investigations -

Job No. A-2 Clark Fork Unit Re-check

Period Covered July 1, 1963 - June 30, 1964

ABSTRACT:

No large scale changes in the habitat or land uses were evident. A gradual trend of conifer trees becoming dominant and crowding out browse and other ground level vegetation is occurring. The winter of 1963-64 was rated as mild for game, with snow accumulating only late in the winter. During the past ten years two winters have been severe for big game, four normal and four mild. Logging has been active in the Unit with approximately 56,000 acres logged in the past five years. Approximately 13% of this logging was in the winter range zone. Approximately 500 miles of main logging roads were constructed. Big game license sales have continued to increase (resident 12% and non-resident 33%) in Mineral and Missoula counties.

Big game population trend information is very limited. Observations suggest the deer population to be stable and the elk population to be slightly higher than in 1959-60. Production checks indicate elk production has been good, white-tailed deer fair, and mule deer poor during the past several years. Losses due to old age, predation, and malnutrition have tended to be light. A significant number (400 deer and 10 elk) are estimated to be killed on the highways and railroads each year in the Clark Fork Unit.

Generally the condition of big game winter ranges is very slightly improved. The improvement in browse condition is limited to an upgrade from very poor to poor condition rating. Browse density was indicated to be 5% less in 1963 than in 1959. Grass and forbs increased about 15% during this time period. Evergreen Ceanothus showed the greatest reduction in density apparently due to winter die-back in 1962-63. A comparison of transects outside and inside an exclosure at one site suggested that big game utilization has suppressed the rate of browse density increase since 1957. There was an increase of only 3% in palatable species outside compared to a 35% increase inside the exclosure. Little use of conifers the past few years was noted, but conifers on 4,300 acres of winter range still appear high-lined.

Hunting regulations have been somewhat less liberal in the Clark Fork Unit during the past four years. A checking station at Frenchtown indicated more elk and less deer harvested in 1963 than the average of 1958-59-60. The big game questionnaire suggested that the highest kill of elk and deer was in 1961 and there has been a trend toward more elk and deer harvested in the Clark Fork Unit. The questionnaire indicated the 1963 kill of elk and

deer was below the past few years average. The greatest decrease in deer harvest in 1963 (39%) was indicated to be in hunting unit 20. The sex and age ratio of animals checked and reported killed suggest good production of elk, but low production of deer. The ratio of elk to deer killed has increased in favor of elk the past few years. Deer weights were slightly lower in the Clark Fork Unit than in the Bitterroot Unit. Hunting pressure is indicated to have reached a peak in 1962 and have been slightly less in 1963 (no extension of the hunting season in 1963). A trend toward a higher proportion of the big game harvest being taken by non-residents is indicated. The weather during the 1963 hunting season was unfavorable for hunting. It is recommended that the season on elk and deer be re-opened in areas with critical range conditions if a good harvest during the general season is not indicated in 1964.

OBJECTIVES:

To determine the current status of big game populations in the Unit. To determine the status of big game forage conditions. To establish permanent plots and methods for determining trends in population, herd composition, range condition, and forage utilization on key areas of the unit where trends have not been determined. To determine the extent and characteristics of the big game harvest and other losses to the big game populations. To further evaluate game management problems and further develop a plan for accumulating game management information within the management unit.

TECHNIQUES USED:

1. Field observations were made by wardens assigned to portions of the Unit, game division biologists, and U. S. Forest Service personnel.

2. Field surveys were made to determine the current status of big game and range. Field trip notes were kept and a record of observations maintained. An effort was made to duplicate trips made in past years to gain a basis for population trends.

3. Established line intercept transects were re-checked and transects established on other key winter ranges. Browse condition transects were re-checked in cooperation with the U. S. Forest Service during the early spring to determine utilization and trend. Pellet group plots were re-checked to determine trend in use of key sites.

4. Sex and age composition data were obtained by sampling winter herds in the unit.

5. Checking stations were maintained to sample the big game harvest for biological information. Hunter questionnaire results were analyzed to determine extent and trend of the big game harvest.

6. Spring field reconnaissance trips were made over important game wintering areas to determine the extent of natural losses. Highway and railroad losses were evaluated.

7. Results were analyzed, evaluated, and compared to past records to determine trends. A report of findings and recommendations for management was prepared.

HABITAT AND LAND USE TRENDS

Location and description: The Clark Fork Unit is made up of approximately 1 1/3 million acres of mountainous type lands, located in the northwest portion of District Two. The valleys in the area tend to be mostly narrow. Less than two percent of the entire unit is cultivated. Seventy-eight percent of the unit is forested land. A large portion of the unit was burned over by the forest fires in 1910 and 1919.

Climate: Average winter temperatures and amounts of precipitation at Superior, elevation 2,710 feet, are given below:

Winter*	Average Temperature (degrees F.)	Total Amount Precipitation (inches)	Relative Rating for Big Game
1954-55	30.9	4.25	Mild
1955-56	28.2	12.65	Severe
1956-57	30.2	7.29	Mild
1957-58	31.1	6.27	Mild
1958-59	32.9	9.56	Normal
1959-60	29.6	5.18	Normal
1960-61	34.3	7.87	Normal
1961-62	29.9	7.92	Severe
1962-63	33.6	8.22	Normal
1963-64	32.6	5.67	Mild
20 yr. average	30.2	7.58	

*Winter = period November, December, January, February and March

Years when temperature was below normal and precipitation above normal were considered as severe for big game. Years when temperature was above normal and precipitation below normal were considered as mild for big game. Other winters were considered as normal for big game. During the past ten years 40% of the winters have been mild, 40% normal, and 20% severe for big game. The winter of 1963-64 rated mild for big game. Normal amounts of snow and cold temperature did not occur until late March.

Vegetation: Vegetative types of the four sub-units are given below: (in percent):

Type	Area 20 N. Superior	Area 21 Ninemile	Area 22 S. Superior	Area 23 Lolo-Petty	Total Unit
Ponderosa pine	39.2	30.3	27.0	32.6	31.9
Larch, Douglas fir	30.7	32.4	21.0	24.2	25.8
White pine, spruce, grand fir, cedar	2.7	1.2	7.0	1.7	3.6
Lodgepole pine	19.6	17.3	14.1	17.9	16.9
Total forest	92.2	81.2	69.1	76.4	78.2
Cottonwood brush, stump pasture	.8	1.9	.4	1.5	1.0
Sub-alpine	2.6	5.8	21.3	3.8	9.7
Non-restocked, burned, cut-over	1.4	2.7	6.6	5.8	4.6
Barren, non-commercial	.4	.6	1.8	2.7	1.5
Grass	.9	3.7	.2	4.9	2.2
Cultivated	1.7	4.1	.9	4.9	2.7

Vegetative types have probably shown no significant change. There is a trend toward gradual reforestation of the non-restocked burned and cutover areas. This is counter-balanced by other areas being clear-cut logged in recent years. Precise figures of the degree of conifer invasion on old burns and clear-cuts are not available.

Ownership: Ownership of lands in the Clark Fork Unit have shown no significant change. Approximately seventy percent is public land administered by the Forest Service, thirteen percent is small private, ten percent Anaconda Company, four percent Northern Pacific, and about three percent State School lands. No doubt, exchange of small private areas has occurred, but the status has remained the same.

Trend in Economy: Agriculture is probably the most stable industry in the unit. However, the amount of lands suitable for farming is relatively small. There appears to have been no significant change in agricultural practices that might influence big game in the unit in recent years.

The timber industry is the major activity in the unit. Several relatively large mills and a paper-pulp plant are present, and considerable timber is shipped to mills outside the unit. In the past five years 55,865 acres have been logged-over in the unit. Twenty-three thousand acres have been clear-cut or cut-slashed and burned (41% of the total logged). Seventy three hundred acres logged were within the winter range zone (about 13% of the total acreage logged). Areas logged by hunting units are as follows:

Hunting Unit	Acres Logged Over	Clear Cut	Big Game Winter Range Zone	Miles new Access Road
20	13,365	6,640	2,143	148
21	7,400	2,600	685	28
22	14,700	8,430	1,420	183
23	20,400	5,378	3,085	158
Total	55,865	23,048	7,343	517

The timber removal has been generally favorable for big game by providing more ground forage, improving access, and increasing the amount of early winter and spring range. The opening up of relatively small areas through the forest has long been recognized as desirable in increasing the value of the habitat by providing shelter and feeding areas in close proximity to each other. Approximately ten percent of the areas logged have been replanted to conifers, but these areas should provide considerable ground forage for 15-20 years until the timber stands become established again.

Approximately 500 miles of roads have been constructed for timber removal in the unit in the past five years. These roads have improved access into many hunting areas. An additional 1,200 miles of spur type logging roads were built, but add little to access into new areas.

There have been no large forest fires in the unit in recent years. The timber is becoming dominant on most of the old 1910-1919 burns. This is unfavorable for big game, especially where it is occurring on big game winter ranges. Thick timber stands eliminate browse and other low vegetation which the game animals depend on for food.

Mining continues to be a minor activity in the unit. A few small mines are operating and there is some active prospecting.

Recreation is very important in the Clark Fork Unit. The Forest Service estimates recreational visits have increased steadily on National Forest lands and at Forest campgrounds in recent years. Big game license sales have continued to increase. A summary of big game license sales in Mineral and Missoula Counties is given below:

	Resident Big Game	Non-resident $100 Big Game	Total Big Game
1933	2,170	6	2,176
1943	3,652	56	3,708
1953	7,694	178	7,872
1959	8,920	426	9,346
1960	9,175	429	9,604
1961	9,763	436	10,199
1962	9,936	532	10,468
1963	10,166	632	10,798

Big game license sales have increased 13% in the past five years (resident 12% and non-resident 33%) in these two counties.

Fifteen outfitters were active during the 1963 hunting season in the unit. Most reported increased numbers of non-resident hunters in recent years. Some of these outfitters operate only during the hunting season and do other work most of the year, but packing contributes to their income significantly.

Most hunters coming into the Clark Fork Unit to hunt spend some money there and thus make some contribution to the economy of the area.

The 1960 federal census showed 3,037 people in Mineral County (31% increase over 1950) and 44,663 people in Missoula County (21% increase over 1950). It appears probable that this upward trend in people will continue.

Major highway construction is in progress in the unit. The right-of-way required for this interstate highway will take a significant portion of the narrow Clark Fork and St. Regis River valleys. It may in some areas make access to the hunting areas difficult (interstate highways are limited access for considerable distances).

Access Status: Access is less limited in the Clark Fork Unit than other units of District Two. However, there are a number of side canyons where because of private holdings at the mouth, access is denied to public lands above. In many of these situations, the U. S. Forest Service is actively proceeding to obtain access.

Timber harvest roads have in some cases provided access to the upper portion of short drainages even though the lower lands are not open to the public.

It appears that the trend on private land is toward less land open to free public use. Land owners report careless shooting, littering, failure

to leave gates as they found them, destruction of equipment, theft of equipment and livestock, etc., as reasons they are closing their lands to the public. Most of the problems occur close to the human population center around Missoula.

GAME RESOURCE TRENDS

HISTORY:

Old-timers in the area report that white-tailed deer, mule deer, elk and black bear were common and mountain sheep were present in portions of the Clark Fork Unit in the late 1800's, when the miners began to come into the area. Big game was hunted year around for food at the mining camps, and as a consequence, by about 1910 the sheep were eliminated and the elk and deer populations were greatly reduced.

During the period 1910 to 1940, hunting regulations were conservative, elk from Yellowstone Park were released in several areas, and much of the unit was put into game preserve status. Elk and deer increased during this period. Portions of the unit became famous for their high deer populations.

From about 1940 to 1955, periodic game study results indicated the game population was too large for the amount of forage available during the winter in some areas. Significant deer mortality, due to malnutrition, occurred in the more severe winters. During the 1955-56 severe winter, moderate numbers of elk and large numbers of deer died of malnutrition in portions of the unit.

POPULATION TRENDS:

Past investigations have been sporadic and limited in scope. Records of population size are meager. Thus, it is not possible to determine precise trends in the big game populations in the Clark Fork Unit. However, general observations and records suggest that the deer population is lower than the peak population about 1948. On the other hand, the elk population appears to have increased during recent years.

Observation of animals appears to be influenced to such a significant degree by weather conditions, human activity, etc., that trend count routes previously established were not rechecked.

The Clark Fork Unit is mostly timbered, which makes aerial counting impractical. Aerial reconnaissance counts in the Petty-Burdette-Lupine Creek burn have been made with the following observations: 1956 - 51 elk, 1960 - 95 elk, and 1964 - 167 elk. The number of elk observed in this relatively high elevation area may be significantly influenced by severity of the winter as well as other factors. The 1963-64 winter was very mild up to the time these observations were made.

HEAD COMPOSITION AND PRODUCTIVITY:

Sex and age composition of deer and elk observed in the Clark Fork Unit in 1963-64 is shown in Table 1, and by hunting district in Table 2.

Summer and fall observations suggest ratios of:

Elk	47 males : 100 females :	54 calves
WT Deer	25 males : 100 females :	68 fawns
Mule Deer	51 males : 100 females :	52 fawns

These small samples suggest that production of elk was good, white-tailed deer fair, and mule deer poor in 1963 in the unit.

Elk production appeared to be good in areas 20, 22, and 23, but only fair in area 21. White-tailed deer production appeared to be poor in areas 20, 21 and 23; fair in area 22. Mule deer production appeared to be poor in areas 20, 21 and 23, and fair in area 22.

Deer were classified as adult or young of the year after December 31 (difficult to recognize shed antler bucks). Results are shown below with past average periods for comparisons:

	White-tailed deer		Mule deer	
Years	No. Classified	Yg:100 adults	No. Classified	Yg:100 Ad.
1935-1943	2247	69	7562	41
1947-1956	1096	53	1913	37
1957-1960	699	55	586	43
1961	118	113	228	87
1962	191	47	114	41
1963	143	49	21	61
1964	632	53	397	39

With the exception of 1961, deer production and/or survival was indicated to be poor in the Clark Fork Unit based on fawns per 100 adults observed (usually the greatest number are classified late in the winter).

POPULATION LOSSES OTHER THAN HUNTING:

There are constant losses to animal populations due to disease, accident, predators, poaching, old age, and malnutrition. These losses tend to be minimized by adequate legal hunting harvest each autumn.

Two transcontinental railroads and one U. S. highway traverse the big game winter ranges along the Clark Fork and St. Regis River. Annual losses from collision on the railroads is estimated at 200 deer (80% whitetailed) and 5 elk. Losses along the highways are estimated as 200 deer and 5 elk. Most of these losses occur during the winter and early spring.

The extent of losses due to disease is not well known. The annual loss of elk due to scabies was significant in the past. Three elk with scabies have come to the attention of the Fish and Game Department the past year. No sick animals were observed during the past year.

Losses due to malnutrition were significant during severe winters from 1947 to 1956. A few deer carcasses were found the spring of 1964 which showed evidence of malnutrition. Most of these were old animals whose teeth were worn down.

Losses due to predators and poachers are known to occur but are not believed to be large. Coyotes are controlled by 1080 poison along the fringe of farm lands. Increasing respect for the game laws and very liberal hunting seasons are believed to be factors tending to cause less illegal kill.

DISTRIBUTION:

Elk, mule deer, white-tailed deer, and black bear are present over nearly the entire Clark Fork Unit. Moose are common in area 23 and occasional in other units. Mountain goats are present in some high portions of area 23.

The distribution of big game is influenced by winter weather conditions. Deep snow forces the big game down onto the lower areas nearly every winter.

There is no definite evidence of major migrations of either elk or deer. It is a common belief that elk in Cache and Oriole Creeks tend to cross the South Fork of Fish Creek to winter in Burdette Creek. Local opinion is that Idaho elk come to Montana to winter and vice versa, depending on when the hunting season occurs. The divide was traveled on the opening day of the Idaho season (Montana still closed) and no significant movement of elk or deer was noted.

It would be desirable to trap and tag elk in area 22 to better determine movement and migration patterns and the relation of "Montana elk" and "Idaho elk".

BIG GAME FORAGE TRENDS

HISTORY:

Excessive utilization of the preferred browse species has been reported on winter ranges in portions of the unit since the first game studies in 1935. By 1942, use on conifers was reported to be excessive and some winter ranges were being "high-lined" by deer eating everything green as high as they could reach. Significant numbers of dead deer were found after the severe winters of 1948-49, 1950-51, and 1955-56. Physical condition of the bones indicated malnutrition as a factor in nearly all dead deer examined. Browse study plots indicated slight improvement in condition and lighter use by game from 1956 to 1960.

TREND IN RANGE CONDITIONS 1959-1964:

Generally, the condition of big game winter ranges appeared to be slightly improved.

Results of browse plot checks in the spring of 1964 are given in Table 3. Based on state-wide standards, the Clark Fork Unit rated "poor" for browse condition (35% of plants are in hedged condition). Leader use averaged 45% by frequency. The high proportion of decadent plants (46%) suggests a general trend toward the plants dying because of old age, plant succession, and overuse.

Trend in browse condition and utilization in the Clark Fork Unit is shown in Table 4. Although some of the hunting units improved to a "fair" condition class the area as a whole rated "poor". The improvement in browse conditions was limited to an upgrade from "very poor" to "poor".

Pellet group density at the browse transect sites is given in Tables 3 and 4. The number of pellet groups have varied between years. The greatest number of both elk and deer pellet groups during the past few years were recorded in 1962.

Line intercept transects, which reflect vegetative composition and density, were rechecked at eight sites in the Clark Fork Unit. The results are shown in Tables 5 and 6.

The density of browse showed a 5 percent decrease. Increases of 5 percent in the density of grass and 25 percent in forbs were indicated. Although no conifers were recorded on the lines checked, it appeared that they were becoming more dominant and starting to "take over" at some sites.

Browse, grass, and forbs all showed a slight increase (3%) in area 20.

Browse and forbs increased in area 22 (browse 8% and forbs 16%). However, 11 percent less grass was indicated.

In area 23, browse decreased 5%, grass increased 5%, and forbs increased 25%.

Vegetative density varied between sites. The most improvement was indicated in the North Fork of Fish Creek area and the greatest decrease in browse was on the West Fork of Petty Creek. Utilization of browse has been moderate to light on both of these sites during the past several years.

There was an overall increase in the density of serviceberry and chokecherry. However, there were less of these species at some sites.

Ceanothus, mostly evergreen, showed a significant decrease in all areas. This is believed due primarily to winter-kill of the Ceanothus during periods of deficient snow-cover. Most of the plants that died back have now resprouted and it appears they will attain their former size within a few years.

The low growing shrubs, Kinnikinic and Oregon grape, were 7% less dense than in 1959. However, these species increased in density in area 22.

There was an average decrease of 9 percent in palatable browse in the Unit. However, in area 22 the desirable species increased 6 percent from 1959 to 1963.

The non-palatable species showed an overall increase of 34 percent. Spirea showed the most increase of any species.

A game-proof and livestock-proof exclosure was constructed on Eddy Creek in 1957. Ten transects were established inside the exclosure and on a similar unprotected area outside the exclosure. The results are summarized as follows:

Grazed Control	Average Percent of Intercept 1957	1963	Change
Palatable Species	20.85	21.57	+3.4%
Unpalatable Species	1.41	1.65	+8.5%
Ungrazed Exclosures			
Palatable Species	25.31	38.9	+35%
Unpalatable Species	2.03	1.16	-43%

These results suggest that grazing has had a significant effect on the browse density at this site since 1957. With no grazing the palatable species have increased a significant amount, but with grazing they did not increase significantly. Unpalatable species increased slightly on the grazed area but decreased considerably on the ungrazed plot.

During the summer of 1959 a field survey of the Clark Fork Unit showed that conifers were highlined in 15 areas totaling 4,270 acres. Ungrazed seedlings and axil sprouts were noted in these areas in 1963-64 suggesting light conifer use the past few years. However, the old high-line on the conifers is still evident over most of these areas.

TREND IN GRASS UTILIZATION:

There are only limited grasslands in the Clark Fork Unit. Most are in the form of small moist stream bottom meadows. Elk use has been quite heavy on some of these meadows in the spring and early summer. Use of 32% of the forage was determined on the Howard Creek meadows by July 1, 1963 before cattle came on to the allotment. Use of 59% of the new growth of forage was noted on the Granite Creek meadows on July 3, 1964 after the cows had been there about two weeks. A portion of the Howard Creek meadows was fenced off to limit cattle use in 1963. Elk use appeared to be lighter on these meadows in the spring of 1964 than in the past few years (based on pellet groups and elk observed). Damage on these meadows had been mostly in the form of stream bank destruction by trampling.

A range cage was constructed on Administration Gulch in July 1963. A recheck of this site in early June 1964 indicated approximately 50% use of grass by big game and horses. Lighter use would be desirable to improve the forage conditions at this site (considerable loose soil, cheatgrass, and weedy species still present).

YEARLY BROWSE PRODUCTION:

Serviceberry production has been checked at two transect sites in the Clark Fork Unit by measuring the annual growth of leaders on tagged stems in early fall. Results are given below:

	Average Growth per leader (inches) 1955-59 Ave.	1960	1961	1962	1963	1960-63 Ave.
Fish Creek Site	3.3	2.0	2.1	2.3	2.7	2.3
Eddy Creek Site	3.1	3.1	3.1	3.4	3.1	3.2

Serviceberry growth had been lower at the Fish Creek site the past four years than the previous five years. Use has been below 50% at this site for the past seven years. However, conifers are becoming dominant at this site and it seems probable that they are competing with the browse for available light and moisture.

Serviceberry growth had averaged slightly better at the Eddy Creek site the past four years than the previous five years. Use has been relatively heavy each winter but there is little competition with conifers.

An acre game enclosure was built in 1957 on Eddy Creek. Annual leader growth on marked plants has been measured each year since 1958 inside and outside the enclosure. Results are shown as follows:

	1958	1959	1960	1961	1962	1963	1958-63 Ave.
Inside	2.8	2.1	2.2	2.0	1.7	1.6	2.1
Outside	3.3	3.5	3.1	3.1	3.4	3.1	3.3

Average growth of leaders has been greater on the plants outside the exclosure than those within. The primary reason for this is believed to be that there were considerably fewer leaders on the unprotected plants. Actually there was more annual growth above the tags on the protected plants. Due to this complication, it is suggested that plants be checked only on years when the unit is given intensive coverage.

LAND USE PROBLEMS:

The extent of actual competition between deer, elk, and livestock in the Clark Fork Unit is not well known. Livestock and game do use many of the same range areas. It appears probable where this livestock use occurs on the game winter range there is potential competition on south slopes and ridge tops. Little competition exists on the high summer range areas.

About 60 percent of the winter range is privately owned. Consequently, the numbers of elk and deer that can be maintained in the Clark Fork Unit depends, to some degree, on how the owners use these lands, and on how much game use the private landowners will tolerate. Complaints regarding big game use on private lands have been received from all hunting areas in the Clark Fork. However, complaints have been fewer the past few years. One farm west of Superior registers a complaint each spring of elk and deer eating their alfalfa and grain. Another damage site is at the Savenac Tree Nursery, where elk cause considerable damage by trampling the conifer seedling beds.

Approximately 2,300 cattle, 100 horses, and 1,800 sheep are grazed on National Forest lands in the Clark Fork Unit during the summer season. The number of livestock permitted and the season of use on the Forest lands have been less in recent years. Trespass stock has been removed more promptly. Other than trailing through winter range areas, the domestic sheep compete very little with big game in the high divide areas they graze. Year long horse use on private and leased lands in Fish Creek was noted. Less horse use could mean more big game in this area.

Cattle were noted to make use of browse on some winter ranges. At one site in the St. Regis area, over 40% of the annual growth had been taken by

fall. In the Ninemile area over 30% of the leaders had been taken by fall. Droppings suggested cow use primarily.

ADJUSTMENTS IN LAND USE:

It appears that generally the harvest of timber has been, and will continue to be, beneficial to big game in the Clark Fork Unit. It would be desirable to log areas in the winter range zone during the winter months to provide the twigs, moss, and lichens for game use. On primary big game winter ranges it would be desirable to prevent conifers from dominating the openings by liberal cutting for Christmas trees, or other purposes.

Available forage supply in the winter range zone is the primary key to the number of big game animals it is possible to carry in an area. On some of these winter range areas, the combined use of big game and livestock is too great and, as a result, at least portions are in poor condition. A possible adjustment that would favor big game in such areas would be reservation of forage for game use in the winter and spring. Where these lands are privately owned, it would seem wise to investigate the possibility of acquisition of grazing rights by land purchase or lease. When such lands are in public ownership, the administering agency should be requested to reserve the forage for game use, if possible.

Game range acquisition and maintenance will logically be costly and have to be limited in extent. It is recommended that further observations be made of primary game ranges also used by livestock in the fall to note the effects of the livestock grazing before the game come onto the range.

The Forest Service districts in the Clark Fork Unit each have or will develop a Wildlife Habitat Management Plan. These plans express the policy of the Forest Service of managing lands in the interest of wildlife, when lands are best suited for this use. It is becoming increasingly evident that steep, rough hillsides with shallow soils are really not primary cattle ranges and should not be considered in the area carrying capacity.

EXPERIMENTAL GAME HABITAT IMPROVEMENT:

In July, 1961, the U. S. Forest Service sprayed approximately 40 acres of browse type land in Dry Creek with herbicide and burned it in the fall. This site had a high percentage density of ninebark and most browse plants were old - many had grown out of reach of the game. The purpose was to kill back the browse and determine if such treatment would provide more game forage.

Two line-intercept transects were established a few days before treatment. These transects were re-read in July 1963, two growing seasons after treatment. Results are shown below:

Feet of Browse Intercept in 200 Feet and Vegetative Hits at Foot Marks

Year	Serviceberry	Red-stem Ceanothus	Ninebark	Snowberry	Grass Hits	Forb Hits
1961	1.8	6.2	53.8	5.8	13	1
1963	0	0	35.0	12.4	38	50

It would seem that the undesirable browse species (ninebark and snowberry) are making a better recovery than the desirable (serviceberry and red-stem Ceanothus). The desirables were not eliminated; however, none were hit on the established transects. Both grass and forbs showed considerable increase (grass a three-fold increase and forbs a 50-fold increase). It is too soon to arrive at any conclusions.

On the St. Regis District a study is in progress to evaluate the effects of clear-cutting and burning of timber lands on the game winter range. Field examinations suggest that good stands of browse and grass will establish themselves on these clear-cuts.

Also on the St. Regis district the conifers on a ten-acre area were cut to determine the value of hand clear-cutting as a tool to increase browse and other low growing vegetation. Insufficient time has elapsed to show any trend or effect on browse and other vegetation.

GAME MANAGEMENT

HISTORY:

Year-long hunting by miners and settlers from about 1875 to 1910 apparently resulted in reduced big game numbers. Conservative seasons, creation of large game preserves, restocking of elk, and more effective game law enforcement resulted in increased elk and deer populations during the period 1910 to 1940. Winter big game studies in the early 1940's indicated that winter ranges in several portions of the unit were being overused. Thus, hunting regulations were gradually liberalized and all game preserves were abandoned.

Either-sex deer hunting was allowed for three days in 1951 and the length of the either sex portion of the season increased until all seasons have been for either-sex since 1955. Two deer were allowed in portions after 1956. Extended seasons for elk and deer in the more critical winter range areas occurred from 1955 to 1963.

REGULATIONS:

A summary of elk and deer hunting regulations in the Clark Fork Unit since 1959 is given in Tables 7 and 8. Regulations on deer hunting have tended to become less liberal since 1960 with less area open for two deer in 1961 and 1962, and no two deer or extended areas in 1963. The regulations on elk have remained about the same with extensions allowed in portions of the unit.

Moose have been hunted on a special permit basis in area 23 in recent years. Since 1959, three either sex moose permits have been granted each year and all except one (1961) has been filled. With the addition of the Miller Creek drainage to area 23 it should be possible to increase the number of moose permits granted.

TREND IN BIG GAME HARVEST:

Information concerning the big game harvest in the Clark Fork Unit has been gained by checking station operations, hunter questionnaires, and field checks.

A checking station was operated at Frenchtown in 1958, 1959, 1960 and 1963. The number of animals checked by hunting unit is given in Table 9.

The greatest number of elk was checked in 1963 (142). However, the entire area opened on the regular season date in 1963, whereas area 22 had opened earlier in 1958, 1959 and 1960. (Frenchtown station not operated during early portion of seasons). Thirty-eight percent more elk were checked from area 22 in 1963 than had been in past years checked. Near the same number of elk have been checked as killed in area 20. A total of 21 elk were checked from area 21 in 1963 compared to average of 16 on past years. A total of 20 elk were checked from area 23 compared to a past average of five.

Slightly more white-tailed deer were checked in 1963 than 1960. However, 30 percent less white-tails were checked in 1963 than the 1958-59 average. The greatest decrease, 49 percent, occurred in area 20. Other areas were only slightly below past average in checked white-tail kill.

About five percent more mule deer were checked in 1963 than in 1960. However, the number of mule deer checked in 1963 was 27 percent less than 1958-59 average. The greatest decrease (53%) occurred in area 20.

Four black bear were checked in 1963 compared to a past average of five. Questionnaire results suggest about 90 black bear harvested in the Clark Fork Unit in 1963.

A checking station was operated on weekends and Veteran's Day in 1963 only on the Lewis & Clark Highway at Lolo. Results are given below:

Hunters checked - - - - -	1585
Elk checked - - - - -	59
Mule deer checked - - -	43
Whitetailed deer checked -	27

Returns from the questionnaire sent out to every tenth big game license buyer are shown in Tables 10 and 11. These results indicate that more elk and deer were harvested from the Clark Fork Unit in 1961 than other recent years. They suggest that the 1963 harvest was 18 percent lower for elk and 16 percent lower for deer than the past six-year average in the Clark Fork.

When considered by the hunting unit the questionnaire results indicate:

Area 20 - North Superior: The highest kill of both elk and deer occurred in 1961. The 1963 elk harvest was 23% below past six-year average. The 1963 deer harvest was 39% below the past six-year average.

Area 21 - Ninemile: The highest kill of both elk and deer occurred in 1961. The 1963 elk harvest was 23% below the past six-year average. The 1963 deer harvest was 5% below the past six-year average.

Area 22 - South Superior: The highest kill of deer was in 1958 and the highest kill of elk was in 1961. The 1963 elk harvest was 31% below the past six-year average. The 1963 deer harvest was 30% below the past six-year average.

Area 23 - Lolo-Petty-Miller Creeks: This hunting unit was enlarged in 1963 which rules out comparison with former years.

The Frenchtown checking station accounted for 12% of the deer and 15% of the elk calculated killed in the Clark Fork Unit by questionnaire returns. Approximately 28% of the elk and 21% of the deer reported as harvested in area 21 were checked at Frenchtown.

DISTRIBUTION OF KILL BY PORTIONS OF THE HUNTING SEASON:

The distribution of kill, based on animals checked at Frenchtown is shown below:

	Elk		Mule Deer		Whitetail Deer	
	No.	% Total	No.	% Total	No.	% Total
First week	44	30.3	28	24.8	22	22.2
Second week	13	9.0	11	9.7	15	15.1
Third week	14	9.7	17	15.0	14	14.1
Fourth week	31	21.4	15	13.3	25	25.3
Fifth week	43	29.6	42	37.2	23	23.3

The highest proportion of the elk were checked the first week of the season, but the kill picked up toward the end of the season, too. The highest proportion of the mule deer were checked the last week of the season. Highest proportion of the whitetailed deer killed came through Frenchtown the fourth week of the season.

Time of kill information reported on the questionnaire is shown below:

Deer	Area 20	Area 21	Area 22	Area 23	Clark Fork Unit
Oct. 20 - 28	18.2%	14.4%	24.0%	18.6%	18.8%
Oct. 29 - Nov.11	31.8%	47.9%	34.0%	51.2%	41.2%
Nov. 12 - 24	50.0%	37.7%	42.0%	30.2%	40.0%
Elk					
Oct. 20 - 28	14.3%	60.0%	22.2%	23.9%	30.1%
Oct. 29 - Nov. 11	35.7%	40.0%	38.9%	36.8%	37.9%
Nov. 12 - 24	50.0%	--	38.9%	39.3%	32.0%

Questionnaire results indicated that the highest proportion of the kill was made during mid season in 1963. However, this information was based on a limited sample.

SEX AND AGE OF ANIMALS HARVESTED:

A summary of sex and age of elk and deer checked in the Clark Fork Unit is given in Table 12.

In 1963, 40.8 percent of the elk checked were bulls, 42.8 percent cows, and 16.4 percent calves. The proportion of bulls harvested was apparently higher in 1963 than recent past years, but less than the long term average of 1942-1959. The proportion of calves taken was slightly lower in 1963 than recent years, but higher than the long term average

of 1942-1959. There has been a lower proportion of bulls and a higher proportion of cows and calves harvested since 1960 than during the period 1942-1959. The ratio of calves to cows was slightly higher in 1963 than the past average.

The sex and age of elk harvested in the Clark Fork Unit based on the hunter questionnaire results is given in Table 13. The reported ratio of harvest was nearly the same as the checked sample. A slightly higher ratio of bulls was reported taken than was checked. The ratio of 36 spikes per 100 branch-antlered bulls suggests good survival of calves through the yearling period. The composition of white-tailed deer harvested in 1963 was 43 percent bucks, 34.8 percent does, and 22.2 percent fawns. A slightly higher proportion of the kill has been bucks since 1960 than the past average. Fewer whitetailed deer fawns in proportion to does have been killed since 1961 than the past average.

The ratio of mule deer harvested in 1963 was 55 percent bucks, 33.7 percent does, and 11.3 percent fawns. A slightly higher proportion of mule deer bucks has been taken since 1960. Fewer mule deer fawns in proportion to does have been taken since 1960 than the prior average.

The ratio of kill is believed to be influenced by hunter preference, weather conditions during the season, time of season, etc., as well as productivity of the herds.

When possible, elk and deer have been aged by dental examination. A summary of results is given in Table 14. There has been no definite trend in age composition shown between the years sampled. Approximately 30 percent of the white-tailed deer harvested have been yearlings, 60 percent prime (two years to smooth), and 10 percent old (smooth molars). Approximately 27 percent of the mule deer have been yearlings, 59 percent prime, and 14 percent old. Nearly 40 percent of the elk harvested have been yearlings, 55 percent prime age, and five percent old. Generally a higher ratio of the younger age class animals have been taken during the early portions of the season and the "old" animals are taken close to the season's end.

The proportion of deer by species and ratio of deer to elk harvested is shown in Table 15. The proportion of white-tailed deer harvested in the Clark Fork Unit has been slightly higher since 1960 than the prior few years. However, the trend in ratio between mule and white-tailed deer has varied between hunting units; the proportion of white-tails has been up in area 29 and down in area 22. The inclusion of the Miller Creek area in hunting unit 23 probably accounted for a higher proportion of white-tailed deer harvested in area 23 in 1963.

A higher ratio of elk to deer harvested is indicated in all hunting units since 1960 than prior years. However, elk made up a slightly lower proportion of the harvest in 1963 than during 1960-61-62.

WEIGHT OF DEER:

Deer that were hog dressed (intact except internal organs) were weighed at the Frenchtown checking station when possible in 1963. Weight by year classes are as follows:

	Males		Females	
	No.	Ave.weight (lbs.)	No.	Ave.weight (lbs.)
Mule deer				
Fawns	2	60	4	55
Yearlings	13	105	4	97
2 Year	7	142	1	70
Prime (3 to smooth molars)	13	158	5	102
White-tailed deer				
Fawns	9	63	10	53
Yearlings	9	105	1	99
2 Year	4	134	3	112
Prime (3 to smooth molars	16	158	7	107

Few deer have been weighed in the Clark Fork Unit in prior years, however; 102 white-tailed and 36 mule deer were checked and most weighed at checking stations on Ninemile and Fish Creeks in 1951. Results are shown below:

	Males		Females	
	No. checked	Ave. Lbs.	No. checked	Ave. Lbs.
Mule deer				
Fawns	1	--	1	--
Yearling	6	105	1	--
2 Year	3	--	1	115
Prime (3 to smooth)	16	162	4	105
White-tailed deer				
Fawns	17	64.5	16	56
Yearlings	11	100	10	82
2 Year	6	142	10	99
Prime (3 to smooth)	19	161	13	109

There appears to be no definite trend in average weight of the deer between years. Probably sample sizes were too limited to get a true mean.

Weights of mule deer at Darby in 1962 were as follows:

	Males		Females	
	No. checked	Ave. Lbs.	No. checked	Ave. Lbs.
Fawns	1	81	1	77
1 1/2 Year	8	116	1	105
2 1/2 Year	1	132	--	--
Prime	3	166	3	120

The mule deer weighed in the Bitterroot averaged slightly more in most age classes than those in the Clark Fork. Range conditions have been noted to be better in the Bitterroot than the Clark Fork, which is probably the basis for this difference.

TREND IN HUNTING PRESSURE:

Big game license sales and questionnaire results indicate more hunters since 1960 than prior years. Numbers of hunters reported hunting in the Clark Fork Unit are shown as follows:

Year	Res. Deer	Non-res. Deer	Res. Elk	Non-res. Elk	Total
1957-58 Ave.	3274	--	3181	--	6455
1959-60 Ave.	3486	229	3485	267	7467
1961-62 Ave.	4538	245	4618	319	9720
1963	3762	280	4097	335	8474

These results indicate there were 13% less hunters using the Clark Fork Unit in 1963 than in 1961-62. The shorter season in area 22 and no extensions may have been responsible for the lighter total hunter use.

There were less total hunters in all hunting units except area 23 which showed an increase (area also larger in 1963 than other years).

The number of hunters checked at Frenchtown was slightly lower than previous years. The average number of hunters checked in 1958, 1959, and 1960 was 1098. In 1963, 1076 hunters were checked. It seems a lower percentage of unsuccessful hunters stop at checking stations than in past years. They apparently believe we are interested only in checking their animals.

Based on the residence of successful hunters checked at Frenchtown, a higher proportion of the 1963 kill was made by residents of District Two and non-resident hunters. The source of successful hunters checked at Frenchtown is given below:

	Deer				Elk			
	1958	1959	1960	1963	1958	1959	1960	1963
District Two	67%	62%	64%	69%	56%	52%	46%	46%
Other Districts	25%	35%	25%	15%	31%	42%	33%	28%
Non-resident	8%	4%	11%	16%	13%	6%	21%	26%

ELK AND DEER HARVEST PER UNIT AREA:

The kill of elk and deer based on hunter questionnaire returns and the hunting unit size is given in Tables 10 and 11. Averages by two year periods are considered to eliminate highs and lows between years.

Hunting area 22 has produced more elk and deer per square mile over the past seven years than any other unit in District Two (2.05 deer per square mile and 1.17 elk per square mile). The basis for this high production is probably in the fact that there is more non-restocked burned-over land in this area than any other. Most of these old burns have considerable forage available in the form of browse.

TREND IN HUNTING CONDITIONS:

The weather preceding and during the hunting season is believed to be one of the more important factors in the amount of game harvested. The accumulation of snow being generally favorable for hunting by causing the game animals to drift to lower, more accessible areas and giving the advantage of "tracking snow". Warm periods with rain are usually light harvest periods. In some instances, more severe weather restricts the hunters by making vehicle travel difficult or impossible into the higher areas or from more distant population centers. Thus, an appraisal of the effects of weather on harvest is difficult.

A summary of weather during the hunting season the past ten years is given below:

	Ave. Fall Temp.* (Degrees F.)	Total Precipitation (Inches)	Adjective Rating for hunting[1]
1954	41.0	1.47	Unfavorable
1955	38.1	4.84	Favorable
1956	39.4	2.88	Average
1957	38.1	3.57	Favorable
1958	41.7	4.64	Average
1959	38.9	3.93	Favorable
1960	42.3	4.20	Average
1961	39.0	4.34	Favorable
1962	43.1	4.42	Average
1963	45.0	2.61	Unfavorable
24 Year Ave.	40.3	3.44	

*October through November

1 Above average temperature and below average precipitation = unfavorable
Above average temperature and above average precipitation = average
Below average temperature and below average precipitation = average
Below average temperature and above average precipitation = favorable

The above criteria suggest that the 1963 season was unfavorable weather-wise for big game hunting.

ADJUSTMENTS IN GAME MANAGEMENT:

Closures and Preserves: There have been no closures or preserves in the Clark Fork Unit the past several years. It is believed that none are needed.

Predator Control: The predators in the Clark Fork are subject to control by livestock raisers, hound men, and others. No need of predator control to benefit game is believed necessary.

Artificial Feeding: There has been very little artificial feeding of big game in the past in the Clark Fork Unit. It is suggested feeding be discouraged.

Game Salting: The value of salt for game is not well known. However, observations indicate game can live without artificial salting and its value to effect distribution is limited.

HUNTING REGULATIONS:

Range trend and utilization observations suggest that elk and deer numbers were too great for the capacity of many winter range areas during the winter of 1963-64. It is believed regulations such as those in effect the past several years would allow an adequate harvest if weather conditions were favorable for hunting. However, on years when the weather is "too nice", it appears probable that an inadequate number of animals would be taken in some areas during the present season dates. It is recommended that seasons for deer and elk be reopened if it appears that a low harvest occurs during the regular season in

area 20 and the Burdette-Petty Creek portion of area 23 (areas where the forage is in very poor condition and was over-utilized during the 1963-64 winter).

It is believed that most of the Clark Fork Unit could be opened along with other early season areas to allow a maximum time to hunt and to make it possible to hunt bull elk while they are still bugling. Past experience has shown that although the game harvest is relatively light during early seasons the total hunting opportunity is substantially increased.

GAME MANAGEMENT RECOMMENDATIONS:

1. It is recommended that range trend and condition plots, browse transects, pellet plots and seasonal reconnaissance of key game ranges be continued in cooperation with the Forest Service to determine trend in range plant condition and utilization.

2. It is recommended that composition of the elk and deer herds be checked annually to determine productivity of the big game herds.

3. It is recommended that weekend checks be made on Lolo Creek and at Frenchtown to determine the trend in the big game harvest and obtain other biological data on the animals killed during the 1964 season. Comparative harvest data would form a basis for the decision of whether a reopening of the season is needed. Unless more elk and deer are taken than in 1963 a reopening on elk and two deer of either sex in area 20 and the Burdette-Petty Creek portion of area 23 is recommended.

4. It is recommended that big game seasons in as much of the Clark Fork Unit as possible continue to open in late September to allow a maximum opportunity to hunt.

Prepared by Fred Hartkorn Approved by Wynn G. Freeman

Date July 20, 1964

Table 1. Sex and age of deer and elk observed in 1963-64

Species	Season	Adult Males	Yearling Males	Females	Adults	Young	Total
Elk	Summer - Fall	18	21	83		45	167
	Winter - Spring	69	50	375		169	663
	Total	87	71	458		214	830
W.T. deer	Summer - Fall	27		108		73	208
	Winter - Spring				278	146	424
	Total				413	219	632
Mule deer	Summer - Fall	36		71		37	144
	Winter - Spring				179	74	253
	Total				286	111	397

Table 2. Sex and age of deer and elk observed in the Clark Fork Unit, 1961-64

		Mule Deer			
Hunting Area	Year	Bucks	Other Adults	Fawns	Fawns/100 Adults
20	1961		21	16	76
	1962	1	12	6	50
	1963				
	1964	13	101	48	42
	1961-64	14	134	70	47
21	1961		7	5	71
	1962				
	1963				
	1964		40	13	33
	1961-64		47	18	38
22	1961		175	157	89
	1962	8	44	18	41
	1963		13	8	61
	1964	22	44	22	33
	1961-64	30	276	205	67
23	1961		25	22	88
	1962	9	25	9	36
	1963				
	1964	14	26	13	33
	1961-64	23	76	44	44

Table 2. Continued

Hunting Area	Year	Whitetailed Deer			
		Bucks	Other Adults	Fawns	Fawns/100 Adults
20	1961		16	23	144
	1962		62	31	50
	1963	12	48	28	47
	1964	13	151	80	49
	1961-64	25	277	162	54
21	1961		2	4	200
	1962		23	11	48
	1963				
	1964	4	74	43	55
	1961-64	4	99	58	56
22	1961		87	91	105
	1962	3	15	4	27
	1963				
	1964	7	69	46	61
	1961-64	10	171	141	78
23	1961		15	15	100
	1962	8	30	15	50
	1963				
	1964	4	61	37	57
	1961-64	12	105	67	57

Hunting Area	Year	Elk				
		Adult bulls	Spikes	Cows	Calves	Calves/100 Cows
20	1964	17	8	99	42	42
21	1964	5		16	6	38
22	1964	27	10	116	49	42
23	1964	31	28	156	77	49
Total Elk		80	46	387	174	45

Table 3. Browse plot measurements, Clark Fork unit 1964

Hunting Unit	Plot Site	Plot No.	Species	No. Plants	% Plants From Class 3 & 6	% of Leaders Used	% Decadent Plants	Pellet Groups Per Acre Deer	Elk
20	Tamarack Cr.	FS #3	Amel	25	32	68	48	20	150
	Tamarack Hill	FS #1	Amel	25	48	83	60	370	0
	Jermyn Ranch	FS #2	Amel	25	68	79	72	310	0
	Patrick Creek	909	Amel	25	80	71	92	310	50
	Patrick Creek	Excl	Amel	25	28	88	32	290	40
	Boyd Mtn-Drexal	906	Amel	25	12	90	4	420	40
	Boyd Mtn-Drexal	908	Amel	25	64	92	64	320	0
	Beacon Hill	FS #4	Amel	25	88	80	96	210	100
	Keystone Dry Gul.	907	Prunus	25	28	32	16	--	--
	Second Creek	Recon	Amel	25	16	3	36	--	--
	Micuyune Gulch	Recon	Prunus	25	48	16	60	--	--
	So. Nemote Creek	901	Amel	25	4	7	0	--	--
	Crystal Springs	Recon	Amel	25	8	33	16	--	--
	Freezeout Gulch	Recon	Amel	25	44	86	60	520	0
	Nigger Gulch	810	Amel	25	84	90	72	800	0
	Kitchen Creek	Recon	Amel	10	50	82	70	180	0
	Eddy Creek	Exclo	Amel	25	40	69	60	220	20
	Soudan	Recon	Amel	25	20	75	80	300	0
	Total & average			435	42	64	52	329	31
21	Sixmile	Recon	Amel	25	52	48	68	260	40
	Butler Creek-High	Recon	Amel	25	28	18	48	100	120
	Butler Creek-Lower	1001	Amel	25	72	15	88	40	60
	Remount Pasture	1002	Amel	50	32	17	58	120	0
	Ellis Creek	Recon	Amel	25	16	44	32	110	20
	Ninemile Hill	Recon	Amel	25	80	88	76	80	0
	Fournier Creek	Recon	Amel	25	28	30	28	100	10
	Total & average			200	44	37	57	116	36
22	Thompson Creek	Recon	Amel	25	48	63	12	100	0
	Whiskey Gulch	Recon	Amel	25	24	58	20	80	20
	Trout Creek Burn	Recon	Amel	25	8	87	76	65	30
	Dry Cr.below Marble	Recon	Amel	25	72	48	84	140	40
	Dry Cr. Exclo.Site	Recon	Amel	25	52	66	64	180	120

Table 3. Continued

Hunting Unit	Plot Site	Plot No.	Species	No. Plants	% Plants From Class 3 & 6	% of Leaders Used	% Decadent Plants	Pellet Groups Per Acre Deer	Elk
	Fish Cr. Blacktail	Recon	Amel	25	4	17	12	120	180
	Trail Cr. East	Recon	Amel	25	16	35	32	220	60
	Trail Cr. West	Recon	Amel	25	4	23	12	120	0
	Clearwater Crossing	Recon	Amel	25	12	30	24	140	160
	Cold Creek - lower	Recon	Amel	25	16	67	64	100	190
	Cold Creek - upper	Recon	Amel	25	20	39	28	55	200
	Little Joe Creek	Recon	Amel	25	4	3	4	15	65
	Thompson Peak Rd.	Recon	Amel	25	8	54	4	220	20
	Johnson Ranch	Amel	Amel	25	64	41	74	65	40
	Total and average			350	31	45	36	124	80
23	Woodchuck Gulch	Recon	Putr	25	12	1	32	0	0
	Little Park Cr.	Recon	Putr	25	0	46	4	60	0
	Deadman Gulch	Recon	Amel	25	12	17	76	120	40
	Hayes Creek	Recon	Amel	10	10	10	10	30	160
	Deep Creek	Recon	Amel	10	10	39	10	10	0
	Petty Cr. Pasture	Recon	Amel	25	16	18	64	65	0
	Albert Creek	Recon	Amel	25	12	12	16	30	30
	West Fork Petty	Recon	Amel	25	12	2	24	40	0
	Tank Creek	Recon	Amel	25	12	10	20	100	40
	Sawmill Creek	Recon	Amel	25	4	30	28	160	80
	Helean Landing	Recon	Amel	25	8	24	24	120	0
	Wall Creek	Recon	Amel	25	8	61	16	180	0
	Wig Creek	Recon	Amel	25	0	35	4	200	0
	West Fork Butte-Low	Recon	Amel	25	32	6	24	80	10
	West Fork Butte-Mid	Recon	Amel	16	63	35	42	60	5
	West Fork Butte-Up	Recon	Amel	25	88	89	92	120	100
	Camp Creek Lower	Recon	Amel	25	72	52	96	80	0
	Clark Creek Lower	Recon	Amel	25	60	12	56	110	5
	Bear Run Creek	Recon	Amel	16	12	55	75	---	--
	Bear Run Creek	Recon	Putr	10	0	74	60	--	--
	Burdette Low Site	Recon	Amel	25	20	55	32	4	142
	Burdette Mid Site	Recon	Amel	25	64	74	60	28	180
	Burdette Upper Site	Recon	Amel	25	84	82	96	8	160
	Golder Road	Recon	Amel	10	0	3	0	40	40
	Holoman Creek	FS #1	Amel	25	0	10	12	30	10
	Clark Fork Unit		1532	547	35	45	46	161	48

Table 4. Trend in browse condition and utilization in the Clark Fork unit

Area	Year	No. Plots	No. plants	% Class 3 & 6	Condition Class	% Leader Use	Pellet Groups Per Acre Deer	Elk
20	1959			59	Very poor	43		
	1960			56	Very poor	39	111	70
	1961	23	460	49	Poor	24	169	35
	1962	15	375	38	Poor	53	369	113
	1963	16	400	68	Very poor	37	145	22
	1964	18	435	42	Poor	64	329	31
21	1960			32	Poor	25	96	36
	1961	9	140	40	Poor	19	167	0
	1962	4	100	26	Fair	32	125	20
	1963	5	120	32	Poor	38	131	120
	1964	7	200	44	Poor	37	116	36
22	1957			47	Poor	31		
	1958			53	Very poor	32		
	1959			62	Very poor	31		
	1960			55	Very poor	21	68	76
	1961	14	335	44	Poor	17	128	77
	1962	13	325	29	Fair	41	258	78
	1963	13	325	51	Very poor	19	89	22
	1964	14	350	31	Poor	45	124	80
23	1959			31	Poor	24		
	1960			22	Fair	17	105	81
	1961	19	261	28	Fair	17	56	84
	1962	17	375	31	Poor	40	73	104
	1963	21	465	39	Poor	8	36	33
	1964	25	547	35	Poor	45	161	48
Clark Fork Unit								
	1959			51	Very poor	33		
	1960			44	Poor	26	195	68
	1961	64	1196	40	Poor	20	138	49
	1962	49	1175	32	Poor	43	222	93
	1963	55	1310	48	Poor	22	92	36
	1964	64	1532	35	Poor	45	161	48

Table 5. Trend in range condition Clark Fork unit

Area	Site	Browse (feet intercept) 1959	Browse (feet intercept) 1963	Grass (Plant hits at foot marks) 1959	Grass (Plant hits at foot marks) 1963	Forbs (Plant hits at foot marks) 1959	Forbs (Plant hits at foot marks) 1963
20	Eddy Creek	184.9	185.7	--	51	--	32
	Nigger Gulch	120.1	122.4	35	39	23	28
		305.0	308.1	35	39	23	28
22	Trail Creek	150.7	160.6	45	34	47	49
	Blacktail	127.1	128.1	29	29	24	35
	Clearwater Cross.	70.0	88.1	1	4	17	21
		347.8	376.8	75	67	88	105
23	Tank Creek	73.2	53.4	31	40	13	17
	Petty Creek Pasture	47.6	54.8	4	10	3	11
	W. Fk.Petty Creek	108.3	41.5	21	19	22	39
		229.1	149.7	56	69	38	67
Clark Fork Unit Total		881.9	834.6	166	175	149	200

Table 6. Trend in browse density, Clark Fork Unit

Area	Site	Year	Feet Inter-cept	Serviceberry & Chokecherry	Evergreen & Red Star Ceanothus	Kinnikinic & Ore. Grape	Palat-able	Snowberry & Spirea	Nine-bark	Other Non-Palat-able	Non Palat-able
20	Nigger Gul.	1959	400	17.8	83.9	--	101.7	--	12.4	.6	13.0
	Nigger Gul.	1963	400	20.8	60.3	--	81.1	28.3	12.4	.6	41.3
	Eddy Cr.	1957	800	2.0	18.3	146.5	166.8	9.7	8.4		18.1
	Eddy Cr.	1963	800	7.6	33.0	131.9	172.5	6.4	6.8		13.2
	Total	1959	1200	19.8	102.2	146.5	268.5	9.7	20.8	.6	31.1
		1963	1200	28.4	93.3	131.9	253.6	34.7	19.2	.6	54.5
22	Trail Cr.	1959	300	89.8	3.1	51.3	144.2	1.7	--	4.8	6.5
	Site	1963	300	85.3	4.8	66.3	156.4	--	--	4.2	4.2
	Blacktail	1959	200	66.7	51.8	1.9	120.4	1.5	2.7	2.5	6.7
	Site	1963	200	86.8	21.4	4.1	112.3	9.4	2.6	3.8	15.8
	Clearwater	1959	200	54.2		6.1	60.3	7.0	--	2.7	9.7
	Crossing	1963	200	66.6		9.5	76.1	11.2	.2	.6	12.0
	Total	1959	700	210.7	54.9	59.3	321.9	10.2	2.7	10.0	22.9
		1963	700	238.7	26.2	79.9	344.8	20.6	2.8	8.6	32.0
23	Tank Cr.	1959	200	13.1	51.4	--	64.5	3.4	5.3		8.7
		1961	200	8.6	37.3	--	45.9	2.6	4.9		7.5
	Petty Cr.	1959	200	37.8	5.5	--	43.3	--	4.3		4.3
	Pasture	1963	200	48.1	.9	--	49.0	4.3	1.5		5.8
	W. Fork	1959	200	47.5	32.4	27.4	107.3	1.0			1.0
	Petty Cr.	1963	200	28.6	6.0	5.2	39.8	1.7			1.7
	Total	1959	600	98.4	89.3	27.4	215.1	4.4	9.6		14.0
		1963	600	85.3	44.2	5.2	134.7	8.6	6.4		15.0
Total Clark Fork		1959	2500	328.9	246.4	233.2	808.5	24.3	33.1	10.6	68.0
		1963	2500	352.4	163.7	217.0	733.1	63.9	28.4	9.2	101.5

Table 7. Deer hunting season regulations in Clark Fork unit 1959-1963

Year	Hunting Unit	Type	Dates	Exceptions
1959	20	2 - Either	Oct. 18 - Nov. 22	
	21	2 - Either	Oct. 18 - Nov. 22	
	22	2 - Either	Sept. 20 - Nov. 22	
	23	1 - Either	Oct. 18 - Nov. 22	
1960	20	2 - Either	Oct. 16 - Dec. 4	
	21	1 - Either	Oct. 16 - Nov. 20	
	22	2 - Either	Oct. 16 - Dec. 4	
	23	1 - Either	Oct. 16 - Nov. 20	
1961	20	1 - Either 2 - Either	Oct. 15 - Nov. 19 Nov. 20 - Dec. 3	Portion north and west of Clark Fork River open
	21	1 - Either	Oct. 15 - Nov. 19	
	22	1 - Either 2 - Either	Sept. 17 - Nov. 19 Nov. 20 - Dec. 3	Portion west of Cedar Creek Road and east of Two Mile Road open
	23	1 - Either	Oct. 15 - Nov. 19	
1962	20	1 - Either 2 - Either	Oct. 21 - Dec. 2 Dec. 3 - Dec. 23	Portion east of Stark Mountain Road open
	21	1 - Either	Oct. 21 - Dec. 2	
	22	1 - Either	Sept. 16 - Dec. 2	
	23	1 - Either	Oct. 21 - Dec. 2	
1963	20	1 - Either	Oct. 20 - Nov. 24	
	21	1 - Either	Oct. 20 - Nov. 24	
	22	1 - Either	Oct. 20 - Nov. 24	
	23	1 - Either	Oct. 20 - Nov. 24	

Table 8. Elk hunting regulations in Clark Fork unit 1959-1963

Year	Hunting Unit	Type	Dates	Exceptions
1959	20	Either	Oct. 18 - Nov. 22	
	21	Either	Oct. 18 - Nov. 22	
	22	Either	Sept. 20 - Nov. 22	
	23	Either	Oct. 18 - Nov. 22	
1960	20	Either	Oct. 16 - Dec. 4	
	21	Either	Oct. 16 - Nov. 20	
	22	Either	Sept. 25 - Dec. 4	
	23	Either	Oct. 16 - Nov. 20	
1961	20	Either Either	Oct. 15 - Nov. 19 Nov. 20 - Dec. 3	Portion north and west of Clark Fork River open
	21	Either	Oct. 15 - Nov. 19	
	22	Either Either	Sept. 17 - Nov. 19 Nov. 20 - Dec. 3	Portion west of Cedar Creek Road and east of Two Mile Road open
	23	Either	Oct. 15 - Nov. 19	
1962	20	Either	Oct. 21 - Dec. 2	
	21	Either	Oct. 21 - Dec. 2	
	22	Either	Sept. 16 - Dec. 2	
	23	Either	Oct. 21 - Dec. 2	
1963	20	Either	Oct. 20 - Nov. 24	
	21	Either	Oct. 20 - Nov. 24	
	22	Either	Oct. 20 - Nov. 24	
	23	Either	Oct. 20 - Nov. 24	

Table 9. Numbers of elk, deer and bear checked at Frenchtown station

Area	Year	W. T. Deer	Mule Deer	Elk	Black Bear
Area 20					
	1958	20	55	25	1
	1959	31	45	29	1
	1960	28	48	30	1
	1963	13	23	28	1
Area 21					
	1958	80	24	16	3
	1959	93	24	15	1
	1960	51	25	18	0
	1963	63	23	21	2
Area 22					
	1958	32	72	44	6
	1959	49	71	58	1
	1960	22	31	32	2
	1963	28	60	73	1
Area 23					
	1958	2	11	6	0
	1959	2	9	4	0
	1960	0	4	5	0
	1963	4	8	20	0
Totals					
	1958	134	162	91	10
	1959	175	149	106	3
	1960	101	108	85	3
	1963	108	114	142	4

Table 10. Trend in elk hunters and harvest based on hunter questionnaire results

Area	Year	Elk harvested by: Residents	Non-res.	Total Harvest	Area sq. mi.	Kill sq. mi.	Number Hunters Residents	Non-res.	Total	Elk per 100 Hunters
20	1957*	298		298			648		648	46
	1958*	265		265			602		602	44
	Ave. 57-58*	282		282	420	.67	625		625	45
	1959	99	22	121	420	.29	364	73	437	28
	1960	128	43	171	420	.40	540	56	596	29
	Ave. 59-60	114	33	147	420	.35	452	65	517	28
	1961	383	28	411	420	.98	720	91	811	51
	1962	258	31	289	420	.69	1190	133	1323	22
	Ave. 61-62	320	30	350	420	.83	955	112	1067	33
	1963	183	16	199	420	.47	701	73	774	26
21	1957*	81		81			324		324	25
	1958*	98		98			426		426	23
	Ave. 57-58	89		89	275	.32	375		375	24
	1959	83	0	83	275	.30	348	20	368	23
	1960	71	0	71	275	.26	360	24	384	18
	Ave. 59-60	77	0	77	275	.28	354	22	376	20
	1961	153	7	160	275	.58	567	21	588	27
	1962	100	0	100	275	.36	559	16	575	17
	Ave. 61-62	126	4	130	275	.47	563	19	582	22
	1963	76	0	76	275	.28	472	25	497	15
22	1957*	506		506			1406		1406	36
	1958*	665		665			1303		1303	51
	Ave. 57-58	586		586	610	.96	1255		1255	47
	1959	812	55	867	610	1.42	1740	131	1871	47
	1960	782	49	831	610	1.36	1953	147	2100	40
	Ave. 59-60	797	52	849	610	1.39	1846	139	1985	43
	1961	904	77	981	610	1.61	1961	167	2128	46
	1962	545	86	631	610	1.03	1893	157	2050	31
	Ave. 61-62	725	81	806	610	1.32	1927	162	2089	38
	1963	472	41	513	610	.84	1645	155	1800	29

Table 10. Continued

Area	Year	Elk harvested by: Residents	Non-res.	Total Harvest	Area sq. mi.	Kill sq. mi.	Number Hunters Residents	Non-res.	Total	Elk per 100 Hunters
23	1957*	316		316			854		854	37
	1958*	281		281			851		851	33
	Ave. 57-58*	298		298	515	.58	853		853	35
	1959	282	22	304	515	.59	812	20	832	35
	1960	171	24	195	515	.38	867	50	917	21
	Ave. 59-60	227	23	250	515	.49	839	35	874	29
	1961	245	14	259	515	.50	1042	21	1063	24
	1962	387	8	395	515	.77	1305	31	1336	30
	Ave. 61-62	316	11	327	515	.63	1173	26	1199	27
	1963	350	0	350	650	.54	1279	82	1361	26
Clark Fork Unit										
	1957*	1201		1201			3245		3245	37
	1958*	1309		1309			3117		3117	42
	Ave. 57-58	1255		1255	1820	.69	3181		3181	39
	1959	1276	99	1375	1820	.76	3264	244	3508	39
	1960	1152	116	1268	1820	.70	3708	289	3997	32
	Ave. 59-60	1214	107	1321	1820	.73	3485	267	3752	35
	1961	1685	126	1811	1820	.99	4290	300	4590	39
	1962	1290	125	1415	1820	.78	4947	337	5284	27
	Ave. 61-62	1488	126	1614	1820	.89	4618	319	4937	33
	1963	1081	57	1138	1955	.58	4097	335	4432	26

*Resident hunters only sampled

Table 11. Clark Fork deer harvest from state-wide questionnaire

Area	Year	Deer harvest by: Residents	Non-res.	Total Harvest	Area sq. mi.	Kill sq. mi.	Number Hunters Residents	Non-res.	Total	Deer per 100 hunters
20	1957*	344		344			637		637	54
	1958*	595		595			476		476	125
Ave.	57-58*	468		468	420	1.11	557		557	84
	1959	261	46	307	420	.73	347	51	398	77
	1960	455	60	515	420	1.23	592	110	702	75
Ave.	59-60	358	53	411	420	.98	470	81	551	76
	1961	797	34	831	420	1.98	980	77	1057	79
	1962	473	40	513	420	1.22	961	109	1070	48
Ave.	61-62	635	37	672	420	1.60	970	93	1063	63
	1963	289	25	314	420	.75	533	49	582	54
21	1957*	479		479			622		622	77
	1958*	552		552			649		649	85
Ave.	57-58*	516		516	275	1.88	636		636	81
	1959	377	11	388	275	1.41	768	23	791	49
	1960	298	0	298	275	1.08	693	9	700	43
Ave.	59-60	338	6	344	275	1.25	730	16	746	46
	1961	551	21	572	275	2.07	904	21	925	63
	1962	315	8	323	275	1.17	832	22	854	38
Ave.	61-62	433	15	448	275	1.62	868	22	890	50
	1963	381	31	412	275	1.50	944	48	992	42
22	1957*	816		816			1275		1275	64
	1958*	1476		1476			1506		1506	98
Ave.	57-58*	1146		1146	610	3.76	1390		1390	82
	1959	1276	99	1375	610	2.25	1507	143	1650	83
	1960	497	19	516	610	.85	1329	72	1391	38
Ave.	59-60	887	56	943	610	1.55	1418	108	1526	62
	1961	1210	91	1301	610	2.13	1961	132	2093	74
	1962	645	55	700	610	1.15	1391	102	1493	47
Ave.	61-62	928	73	1001	610	1.64	1676	117	1793	56
	1963	655	64	719	610	1.18	1051	112	1163	62

Table 11. Continued

Area	Year	Deer harvest by: Residents	Non-res.	Total Harvest	Area sq. mi.	Kill sq. mi.	Number Hunters Residents	Non-res.	Total	Deer per 100 hunters
23	1957*	499		499			693		693	72
	1958*	553		553			666		666	83
	Ave. 57-58*	526		526	515	1.02	680		680	77
	1959	464	13	477	515	.93	855	24	879	54
	1960	341	19	360	515	.70	881	27	908	40
	Ave. 59-60	403	16	419	515	.81	868	26	894	47
	1961	643	14	657	515	1.28	1042	21	1063	62
	1962	401	15	416	515	.81	1004	14	1018	41
	Ave. 61-62	522	15	537	515	1.04	1023	18	1041	52
	1963	579	55	634	650	.98	1234	71	1305	49
Clark Fork Unit										
	1957*	2138		2138			3239		3239	66
	1958*	3176		3176			3308		3308	96
	Ave. 57-58*	2657		2657	1820	1.46	3274		3274	81
	1959	2378	169	2547	1820	1.40	3477	241	3718	69
	1960	1591	98	1689	1820	.93	3495	218	3713	45
	Ave. 59-60	1985	134	2119	1820	1.16	3486	229	3715	57
	1961	3201	160	3361	1820	1.85	4887	244	5131	66
	1962	1834	118	1952	1820	1.07	4188	247	4435	44
	Ave. 61-62	2516	139	2655	1820	1.46	4538	245	4783	56
	1963	1904	175	2079	1955	1.06	3762	280	4042	51

*Resident hunters only

Table 12. Sex and age of big game checked in the Clark Fork unit

Species Years	Bulls No.	Bulls %	Cows No.	Cows %	Calves No.	Calves %	Total No.	Ratio Bulls:Cows:Cal.
Elk								
1942-1959	367	45.0	331	40.6	117	14.4	815	111:100:35
1960	56	35.7	75	47.7	26	16.6	157	75:100:35
1961	16	34.0	23	48.9	8	17.1	47	70:100:35
1962	2	33.0	3	50.0	1	17.0	6	67:100:35
1963	82	40.8	86	42.8	33	16.4	201	95:100:38
1960-1963	156	38.0	187	45.5	68	16.5	411	83:100:36
	Bucks No.	Bucks %	Does No.	Does %	Fawns No.	Fawns %	Total No.	Ratio Bucks:Does:Fa.
W. T. Deer								
1951-1959	231	38.2	191	31.6	183	30.2	605	121:100:96
1960	47	42.7	41	37.3	22	20.0	110	115:100:54
1961	9	52.9	5	29.4	3	17.7	17	180:100:60
1963	58	43.0	47	34.8	30	22.2	135	123:100:64
1960-1963	114	43.5	93	35.5	55	21.0	262	123:100:59
Mule Deer								
1951-1959	334	50.8	228	34.1	99	15.1	657	149:100:44
1960	66	60.0	34	30.9	10	9.1	110	194:100:29
1961	3	25.0	7	58.3	2	16.7	12	43:100:29
1962	1	50.0	1	50.0	0	0	2	100:100:0
1963	88	55.0	54	33.7	18	11.3	160	163:100:33
1960-1963	158	55.6	96	33.8	30	10.6	284	165:100:31

Table 13. Sex and age of elk based on questionnaire returns

Area	Year	Mature Bull	Spike	Cow	Calf	Ratio Spikes:100 Mat. bulls	Ratio Bulls: 100 cows	Ratio Calves: 100 cows
20								
	1960	76	21	62	14	28	156	23
	1961	114	84	136	77	74	146	57
	1962	123	22	87	57	18	167	66
	1963	61	8	100	30	13	69	30
	Ave.	94	34	96	45	36	133	47
21								
	1960	0	14	55	0		25	
	1961	38	46	46	31	121	183	67
	1962	14	0	72	14	0	19	19
	1963	30	15	15	15	50	300	100
	Ave.	21	19	47	15	90	85	32
22								
	1960	221	104	381	152	47	85	40
	1961	341	92	387	160	27	112	41
	1962	206	72	288	65	35	97	23
	1963	84	30	283	115	36	40	41
	Ave.	213	75	335	123	35	86	37
23								
	1960	76	35	69	28	46	161	41
	1961	106	15	123	31	14	98	25
	1962	151	43	143	57	28	136	40
	1963	137	46	137	30	34	134	22
	Ave.	118	35	118	37	30	130	31
Clark Fork Unit								
	1960	373	174	567	194	47	96	34
	1961	599	237	692	299	40	121	43
	1962	494	137	590	193	28	107	33
	1963	312	99	535	190	32	77	36
	Ave.	445	162	596	219	36	102	37

Table 14. Age by dentition of elk and deer in the Clark Fork unit

Species & Year	Sample size	% Yearling	% Prime	% Old	Ratio Yearlings/ 100 adults	Ratio Old/ 100 Prime
White-tailed deer						
1951 & 1955	78	31	63	5	45	8
1958 & 1959	80	26	51	23	36	44
1960	66	24	64	12	32	19
1963	78	31	60	9	44	15
Mule deer						
1951 & 1955	70	26	66	8	35	13
1958 & 1959	102	27	54	19	38	35
1960	55	30	49	21	43	43
1963	87	26	63	11	36	16
Elk						
1958 & 1959	26	46	50	4	86	8
1960	16	25	56	19	33	34
1963	44	43	55	2	76	4

Table 15. Proportion of harvest by species based on questionnaire results

Area Year	Mule deer	Whitetailed deer	% W.T.deer	Elk	Elk:100 Deer harvested
20					
1957-58-59 Ave.	234	181	43.6	228	54.9
1960-61-62 Ave.	294	318	52.0	290	47.4
1963	123	176	58.9	199	66.6
21					
1957-58-59 Ave.	126	347	73.4	87	18.4
1960-61-62 Ave.	84	296	77.9	110	28.9
1963	107	282	72.5	76	19.5
22					
1957-58-59 Ave.	700	522	42.7	679	55.6
1960-61-62 Ave.	429	347	44.7	814	104.9
1963	452	252	35.8	513	72.9
23					
1957-58-59 Ave.	256	254	49.8	300	58.8
1960-61-62 Ave.	239	222	48.2	283	61.4
1963	260	358	57.9	350	56.6
Clark Fork Unit					
1957-58-59 Ave.	1316	1304	49.8	1294	49.4
1960-61-62 Ave.	1046	1183	53.1	1497	67.2
1963	942	1068	53.1	1138	56.6

JOB COMPLETION REPORT
INVESTIGATION PROJECT

State of Montana

Name Wildlife Investigations, District Two

Project No. W-72-R-11

Title Big Game Surveys and Investigations -

Job No. A-2

Blackfoot Unit Re-check

Period Covered: July 1, 1965 - June 30, 1966

ABSTRACT:

The winter of 1965-66 was mild and elk and deer were less concentrated than normal. Timber harvest has continued to be active in the Unit with near 52,000 acres cut-over the past five years. Approximately, five hundred miles of access roads have been constructed for this logging. Livestock grazing continues to be heavy with strong demand for rangelands. The Blackfoot continues to become more popular as a recreation area.

Productivity in the elk herds is indicated to be good but productivity in the deer herds is indicated to be only fair. The trend in loss of white-tailed deer from malnutrition has been upward the past several years. Elk and deer numbers appear to be near static in most of the Blackfoot Unit, but slightly lower in District 29.

To date 34% of the 1126 elk that have been ear-tagged and released in the Blackfoot Unit during the past 14 years have been reported killed. A higher proportion of bulls than cows has been reported shot. Bulls have been shot further from the release sites than cows and at a younger age. The movements of native elk have been generally to higher elevations between the major drainages where they winter. Yellowstone Park elk released on the Blackfoot Clearwater Game Range have dispersed widely; primarily to the south.

General range conditions on key game wintering areas have improved slowly and remain in poor condition. Complaints of damage to range and haystacks by elk and deer have continued in portions of the unit. Exclosures in the unit have shown that recovery of areas in poor condition is slow even with no grazing.

Hunting regulations have been less liberal the past four year period. Hunter questionnaire results indicate 20% less elk and 35% less deer killed yearly during the period 1962-1965 than the period 1957-1961. Elk have made up a higher proportion of the kill the past four year period. During the past 15 year period a ratio of 101 bulls per 100 cows has been checked from the Blackfoot. Bulls have been taken in a ratio of 86:100 cows the past four years. The ratio of bucks to does has increased in recent years. During the past 15 year period 48 mule deer fawns and 64 white-tailed fawns per 100 does have been checked at Bonner. The proportion of yearling elk and deer killed has been greater and the proportion of "old" animals lower the past four years based on animals aged by dentition. Yearling deer are taken in greatest

proportion during the first part of the season. Weights of deer from the Blackfoot are given. The average weight of prime aged deer has been less in recent years (lower average age believed to be a factor). Questionnaire results indicate an average annual harvest of 110 black bear and 1.6 grizzly the past five years. Success on mountain goats has been lower the past several years (due in part to adverse weather). A checking station was operated east of Lincoln on Route 20 for 22 days and 86 elk, 154 deer and 1086 hunter trips were checked.

It was recommended that seasons be reopened in portions of the Blackfoot with winter ranges in poor condition if minimum numbers are not harvested during the regular season. It is also recommended that information concerning range, animal condition and productivity, and harvest be obtained each year to form a basis for management.

OBJECTIVES:

To determine the status and trend of big game populations, harvest, production, herd composition, and forage conditions in the unit in a more intensive manner than can be accomplished during the District-wide surveys.

PROCEDURE:

1. Current information on big game winter ranges, obtained by aerial and ground surveys, was added to the big game winter range maps.

2. New permanent range survey and pellet count sample plots were established on key areas not previously sampled, and studies on established plots were continued.

3. Sex and age composition counts of important herd units were obtained by sample counts from helicopter or ground.

4. Losses on important wintering areas were determined by spring field reconnaissance.

5. Harvest trends and biological data were determined by checking stations, roving patrols, and the statewide questionnaire.

6. Livestock use and competition with game on important winter game ranges were determined.

7. When possible, big game range surveys were made in cooperation with the Forest Service, Bureau of Land Management, and other land management agencies concerned.

8. A report summarizing trend data and containing recommendations for management based on current information was prepared.

HABITAT AND LAND USE TRENDS

History

The area was settled after 1860 with mining and agriculture the initial major activities. Mining was most active in the southern portion of the unit. A number of "ghost towns" and ore mills are still present in the back country.

Lumbering has been an important industry in the Blackfoot since about 1890. The Anaconda Company mill at Bonner is one of the largest in Montana and has been in operation since the turn of the century. Logging was started on National Forest lands in about 1946.

Climate

The climate in the unit is characterized by summers with warm days and cool nights and relatively long, cold winters. Precipitation varies considerably over the area. Long term yearly averages are: Drummond 11.5 inches, Ovando 15.9 inches, and Seeley Lake 23.4 inches. Most of this is in the form of snow and this influences the accessibility of forage for game. The complex of temperature and precipitation during the period of November through March each year is believed to be an indication of the severity of the winter for big game. Average temperatures and amounts of precipitation during these months for the past ten years near Ovando, 4100 feet elevation, are as follows:

Winter	Average Temperature	Total Amount Precipitation (inches)	Relative Severity for Big Game
1956-57	20.5	5.96	Normal
1957-58	24.7	6.06	Mild
1958-59	23.0	10.98	Severe
1959-60	20.8	5.68	Normal
1960-61	25.5	5.16	Mild
1961-62	20.0	7.22	Severe
1962-63	24.5	6.96	Normal
1963-64	24.1	6.59	Mild
1964-65	22.9	9.87	Severe
1965-66	24.6	5.22	Mild
24 year average	23.2	6.92	

Normal = Above average temperature and above average precipitation or below average temperature and below average precipitation.

Mild = Above average temperature and below average precipitation.

Severe = Below average temperature and above average precipitation.

Vegetative Cover Trends

The Blackfoot Unit is near 67% timbered. Area 29, Garnet Range-South Lincoln, has the highest proportion of grassland (27%). Less than five percent of the land is cultivated.

The trend in vegetative cover may be toward slightly more open area due to considerable clear-cut logging. Approximately 52,000 acres have been logged the past five years in the Blackfoot Unit (Table 1). Most of this logging has been clear cutting with the slash piled and burned, which has resulted in open areas. Approximately 20% of the logging was in the winter game range zone, but this area was more frequently selectively cut, being mostly ponderosa pine type.

Examination of logged and burned areas in the Blackfoot showed that regeneration of conifers is quite rapid on most sites. It appears that conifers are again dominant in about 20 years after clear-cutting or burning. Browse regeneration was fair on several sites examined which had been logged nearly ten years ago. Transects were established prior to logging and burning in the Shanley Creek area in 1965, which should provide information on browse response following logging.

Ownership Trends:

There have been some changes in ownership of private lands, but no trend that would result in significant land use changes. A relatively high proportion of lands are privately owned (54 percent) by ranches and timber companies. Federal public land in the Garnet Range (Area 29) is administered by the Bureau of Land Management. Most of the federal land in the other portions of the unit is administered by the Forest Service.

Trend in Economy:

The timber industry has been active in recent years. Mills in Missoula, Bonner, Seeley Lake, Drummond, and Lincoln are supplied at least in part by Blackfoot timber.

Agriculture is the most stable industry in the unit. There has been a trend toward increasing cattle and decreasing sheep in recent years. The demand for range for livestock appears to be increasing. In some instances this has caused grazing fees to increase considerably.

Recreation is very important in the Blackfoot unit. Over twenty dude ranches and commercial packers operate in the unit. The number of summer homes and hunting cabins has shown a steady increase in recent years. The Forest Service reports show a gradual increase in recreational visits to Forest lands.

Big game license sales in Powell and Missoula Counties in recent years:

Year	Resident big game	Non-resident big game
1933	4,432	8
1943	4,278	82
1953	8,421	173
1963	10,631	551
1964		
1965		

GAME RESOURCE

History

The limited records available suggest that elk, white-tailed deer, mule deer, black and grizzly bear, mountain goat, and mountain sheep were common in at least portions of the Blackfoot Unit at the time of settlement, about 1870. Big game animals were used yearlong for food by the miners and other settlers. By 1910 reports indicate that the mountain sheep were exterminated and the elk and deer populations were relatively low. Hunting regulations were made more conservative in 1910. Big game studies in 1935-37, 1941-43, 1948-49, and 1955-56 reported winter range over-use and mortality of deer on the more severe winters. The elk population increased from about 1910 to 1955. The white-tailed deer population has tended to become smaller since approximately 1943. The mule deer population has tended to become smaller since about 1948.

Trend Counts

Due to the high proportion of timbered lands in the Blackfoot, aerial elk counts have proved difficult to accomplish over much of the area. It is believed, based on experience in other areas, that better and more reliable elk counts could be accomplished at "green-up" time in the spring. However, limitations of personnel and aircraft have at this time not made it possible to accomplish such counts. Aerial observations in recent years are given in Table 2.

These counts have been influenced by weather, intensity of coverage, and other physical factors as well as elk population numbers. The coverage in the Lincoln-Alice Creek area in 1966 was made under good flying and observation conditions and showed the highest number of elk ever counted in this area. The mild nature of the 1965-66 winter allowed considerable dispersion of both elk and deer which made census difficult.

Winter ranges in the Blackfoot adjacent to roads have been checked toward evening with a primary objective of obtaining sex-age information of the game herds. The best counts of animals observed is shown for 1962 and 1966 in Table 3. More white-tailed deer, but less mule deer and elk were observed along these routes in 1966 compared to 1962.

Based on general field observations, harvest success, and winter range utilization it is believed that the elk and deer populations are about the same in 1966 as they were in 1962 in hunting units 28, 280, and 281, but are lower in area 29.

Herd Composition and Productivity

The sex and age of animals observed was recorded when classification was possible. A helicopter was used in the Lincoln area for elk classification. Results are given in Tables 4, 5, and 6.

A ratio of 47 calves per 100 cow elk was indicated for the period 1961-1966. This is the same ratio as observed from 1943-1958 in the Blackfoot. This ratio suggests relatively good elk production in the Blackfoot. The limited sample of elk classified in hunting district 29 indicated slightly higher production (50 calves:100 cows).

Mule deer productivity is indicated to have been fair in the Blackfoot in recent years. An average of 46 fawns per 100 adult mule deer has been noted during the period 1961-1966. The trend in mule deer production has been toward slightly greater annual production during the period 1961-66 than during the period 1956-60; but mule deer production was noted to be considerably greater during the period 1943-1948 (75 fawns:100 does).

White-tailed deer production was indicated to be greater during the period 1961-66 (49 fawns:100 adults) than during the period 1956-60 (40 fawns:100 adults). However, production of white-tailed deer was greatest during the period 1936-50 (74 fawns:100 adults average). Relative to other areas, production of white-tailed deer in the Blackfoot is average.

The proportion of young of the year to older animals checked at Bonner during the hunting season is given in Table 7.

These kill data suggest that production of elk and deer has fluctuated considerably during the past four year period. During the period 1962-65 production of elk and mule deer has been lower than the average for the 1951-1961 period. Production of white-tailed deer has increased during this period compared to prior years.

The kill ratio is believed to represent a lower than actual proportion of young than actually occur in the herds due to selection of larger animals by hunters. However, the same bias probably occurs each year so that variation in kill ratio should indicate variation in the actual young/adult female ratio between years.

Population Losses Other Than Hunting

There are constant losses to animal populations due to disease, accident, predators, poaching, old age, and malnutrition. These losses are minimized by maximum hunter harvest each fall.

The Blackfoot Unit is fringed and intersected by several improved highways, and one railroad branch line. Fast highway travel, especially large trucks, kills a significant number of deer and a few elk each year. Losses are greatest in the late winter and early spring when the animals are forced down by snow or attracted by "green-up" vegetation on the road shoulders. The trend in highway losses is believed to be toward more such losses as traffic increases.

Illegal hunter harvest is believed to be decreasing as seasons have been more liberal in recent years. Poaching is seemingly more common in the Blackfoot than other portions of District Two.

Coyotes, cougar, bobcat, lynx, and bear are present in the Blackfoot and probably take a few game animals. However, their numbers are not high and it seems probable they take mostly the weak animals.

There has been little evidence of diseased game in the Blackfoot in recent years.

Losses due to old age are difficult to separate from losses due to malnutrition. It is probable that worn-down teeth contribute to death from malnutrition.

A 480 acre plot, east from Camp Nine to the Clearwater River, has been checked by mass coverage each spring since 1956 to determine the number of dead deer. The results are as follows:

Year	Dead deer per square mile	Type winter preceding
1956	90	Severe
1957	75	Normal
1958	39	Mild
1959	33	Severe
1960	18	Normal
1961	8	Mild
1962	39	Severe
1963	6	Normal
1964	44	Mild
1965	67	Severe
1966	19	Mild

The number of dead deer found since 1962 has fluctuated as has the intensity of the winters in the Blackfoot. Losses during the more severe winter of 1964-65 were third highest of the years checked. The trend in losses appears to be increasing the past several years.

Most of these losses have been white-tailed deer. A high proportion have been fawns or very old aged animals.

Movements and Migrations

A total of 659 native elk have been trapped, ear-tagged, and released and 467 tagged elk (from Yellowstone Park) have been released in the Blackfoot Unit from 1950 to 1966. A summary of returns to date and information gained from recoveries of these tagged elk is shown in Tables 8, 9, 10, 11, and 12.

To date 34% of the tagged elk have been reported killed. Recoveries have been greatest the first year after tagging and release (15%) with diminishing returns up to ten years with no recoveries over ten years after release to date (some elk tagged 14 years ago).

Male elk tagged have been reported killed in a slightly higher proportion (38%) than females (35%). The average age of males killed is lower than females based on calves tagged. The average age that the male calves were killed is 2.8 years and female calves 3.5 years (these average ages will increase with time). Male elk were reported killed further from the release site than female elk.

Generally, the native elk tagged and released have tended to drift to higher elevations between the drainages where tagged. To date 92% of the tagged elk reported killed were reported to have been taken in the Blackfoot drainage and 8% have been reported killed in the South Fork of the Flathead (native elk tagged in Blackfoot drainage). Maps showing drift are included in W-72-R-7 Completion Report.

The Yellowstone elk released on the Blackfoot-Clearwater Game Range have tended to drift to the south most frequently and in some cases have drifted a considerable distance.

Little of a positive nature is known about deer migrations in the Blackfoot. Based on general observations it is believed that the mule deer tend to make seasonal movements from high to lower elevations along or parallel to, major stream drainages. Some white-tailed deer tend to move to the high divide country to summer while others tend to remain in the low country all year.

BIG GAME FORAGE TRENDS

History

Reports indicate generally excessive use of the foothill ranges by livestock from 1870 to the present. Horse and sheep numbers have been reduced but beef cattle numbers have increased since 1950.

Some winter ranges were reported to be over-stocked by white-tailed deer (with resulting winter starvation losses) in 1936 at the time of the first game studies. Elk and deer depredation of haystacks in the Blackfoot from 1935 to 1957 suggest inadequate range forage. The reservation of forage for winter game use by acquisition and leasing of lands in the lower Clearwater area has helped to overcome this problem in that vicinity.

Trend in Range Conditions

Condition and trend of ranges used by big game in the Blackfoot Unit varies considerably. With the possible exception of small local areas such as around licks, the higher ranges used by game only in the summer and fall are in satisfactory condition with no downward trend. However, many of the lower range areas where game are forced to spend the winter and early spring are in unsatisfactory condition.

Grass condition transects have been established at several sites in the Blackfoot Unit. Results of recent rechecks at these sites are given in Table 13.

On the Blackfoot-Clearwater Game Range rough fescue, a very palatable species, was found to be going down in condition on one site and improving on another site. Efforts to get better distribution by salting have not been successful to date. Utilization has averaged 42% the past 5 years at the site that is retrograding and 9% at the site that is improving.

The condition of rough fescue grass has improved at the Baldy Mountain site south of Lincoln. Utilization on rough fescue has been less than 15% each year since 1962. There has been no domestic stock use in recent years on this site.

The condition of rough fescue grass has improved slowly on the Lewis and Clark Pass site and was in fair condition in 1965. Line intercept transects established and rechecked by the Forest Service at this site indicate general range improvement and an excellent condition rating. Utilization of rough fescue was found to be 38% the spring of 1966.

The condition of three species of grass at the Telephone ridge site was checked in 1966. Rough fescue was found to be in poor condition and blue-bunch wheatgrass and Idaho fescue was found to be in good condition. Utilization was noted to be 40% of rough fescue, 16% of Idaho fescue, and 10% of blue-bunch wheatgrass the spring of 1966 at this site.

Browse condition and utilization transects have been checked in the Blackfoot since 1957. Results are given in Table 14.

The condition of browse in Area 28 was found to be poorer in 1966 than it had been in 1962. With an average of 39 percent severely hedged plants the area was rated poor for condition. Browse at 40 percent of the sites was rated good, 5 percent was rated fair, 20 percent was rated poor, and 35 percent was very poor in Area 28. Average utilization during 1962-66 was 48 percent of new leaders. This degree of use is considered near proper for browse in good condition but should be lighter to expect improvement. The proportion of decadent plants has become slightly less in Area 28. Pellet group observations showed nine percent less deer use and 31 percent less elk use in 1966 as in 1962 at the browse transect sites in Area 28. Pellet groups show a ratio of 83 elk per 100 deer using the sites checked in 1966.

The condition of browse in Area 29 was found to be slightly improved in 1966 compared to 1962. The condition rating with 60 percent of the plants in a severely hedged condition was still very poor. Fifty percent of the sites checked rated very poor in 1966, 25% poor, 8% fair, and 12% good. Average utilization the past four years has been 49% of the new twigs. The proportion of decadent plants has decreased, over-all, but in the eastern portion of the Garnet Range the browse has become more decadent. Less deer and elk pellet groups were noted at the sites checked in 1966 than in 1962. Pellet groups in Area 29 show a ratio of 1 elk per 200 deer using the sites checked in 1966.

The condition of browse in Area 281 was found to be improved in 1966 compared to 1962, but with 36 percent of the plants severely hedged, the browse is still in poor condition. Browse at 20 percent of the sites was in good condition, 20 percent fair, 40 percent poor, and 20 percent very poor.

Average utilization of past years growth has been 47 percent from 1962 to 1966. The proportion of decadent plants was lower in 1966 than in past years. The number of elk and deer pellet groups at the check sites was less in 1966 than in 1962. Based on pellet group counts, a ratio of 51 elk per 100 deer using the sites checked in Area 281 is indicated.

In 1959 a survey of the extent of conifer high-lining was conducted in the Blackfoot unit. This survey showed that conifers were high-lined on 33,470 acres of game winter range as high as deer could reach. Recent observations in these areas showed conifer seedlings becoming established on some sites but little recovery of trees high-lined in the past.

Game and livestock exclosures show that the recovery of "beat" winter ranges has been slow even with non-use. An exclosure constructed in the Salmon Lake Hills area in 1953 shows improvement in condition of low growing shrubs, grass, and other palatable browse species, but to a degree that is not noticeable at some distance. An exclosure was constructed on Ovando Mountain in 1959. Transects in and out of this exclosure show palatable browse density to have increased near 20% inside and less than 1% outside by 1965.

Game Damage Complaints

Game damage complaints have continued in the Blackfoot Unit. Damage has been reported due to elk and deer using haystacks in the Helmville and Drummond areas each year since 1962. Damage to pasture land by elk has been reported by a rancher near Mineral Mountain the past several springs.

Land Use Problems

Large areas of foothill range that are suitable for game winter range are in private ownership and the forage is consumed annually by livestock by fall. Approximately eighty percent of the deer and elk in the Blackfoot Unit winter on private lands. Consequently the numbers of elk and deer that can be maintained depends, to a high degree, on how heavily these winter range lands are grazed by livestock and how much game use the private land owners will tolerate.

Grazing on U. S. Forest Service lands in the Blackfoot has been reduced slightly in recent years. Use by domestic sheep on the Lincoln District will be near 10% less in 1966 than in 1965.

Livestock grazing has not been closely regulated on lands leased from the State, BLM, Anaconda Company, and Northern Pacific Railway. The BLM has started field surveys to determine if lands they lease are being over-grazed. Many of these lands have been very heavily grazed in the past.

Adjustments in Land Use

Available forage supply in the winter range zone appears to be the key to the number of big game animals it is possible to carry in an area. In many of the winter range areas the combined number of big game and livestock is too great. As a result, at least portions of these areas are in poor

condition. A possible adjustment that would favor big game in such areas would be reservation of forage for game use in the winter and spring. Where these lands are privately owned, it would seem wise to investigate the possibility of acquisition of grazing rights by purchase or lease. Where such lands are in public ownership, the administering agency should be requested to reserve forage for game use.

Such management will logically be costly and have to be limited in extent. Areas where such land use adjustment should logically provide the greatest benefit for big game in the Blackfoot Unit are:

1. Mineral - Markham Mountain and lower Lincoln Canyon:

   This area is a key winter range for both elk and deer. Ownership is approximately: 3 sections local ranchers, 4 sections Anaconda Company, and 3 sections Bureau of Land Management.
   Land description: All, or portions of, Sections 13, 14, 23, 24, 25, 26, T. 14N, R.11W; and 18, 19, 20, 21, 22, 27, 28, and 29, T14N, R10W.

2. Lower Dalton Mountain - Wasson Creek:

   This area is key elk and deer winter range. Ownership is approximately 3 sections local rancher which abuts National Forest.
   Land description: All, or portions of, Sections 6, 7, 8, and 17, T. 13N, R. 10W.

3. Dry Cottonwood - Shanley Creek:

   This area is used heavily in the spring and fall as elk move to and from the Blackfoot-Clearwater Game Range. Ownership is approximately: 4 sections local rancher, and 5 sections Anaconda Company.
   Land description: All, or portions of, Sections 19, 20, 21, 23, 25, 26, 27, 28, and 29, T. 16N, R. 13W.

A general range condition and capacity survey was made in the Garnet Range area in 1963 and 1964 by the Bureau of Land Management. Range conditions were found to be unsatisfactory at many sites. In an effort to improve range conditions it is planned to reduce livestock grazing 15% each year for three years and fence portions to control use. It seems logical that this reduction in livestock use will benefit game in this area.

Big game animals would receive greater benefit from logging if the south and west exposed slopes in clear cut areas were not planted or were planted with seed or seedlings of browse species palatable to game instead of tree seedlings. Frequently these are not good timber growing sites but due to less snow accumulation are sites where forage is more available to animals in the winter. This practice may be acceptable only on public lands.

GAME MANAGEMENT

Trend in Legal Hunting

Most of the Blackfoot Unit was closed to elk hunting entirely in 1914 (except Clearwater-North Fork area). Only short either sex and bull hunting was allowed in portions until about 1954 when the majority of the unit was opened to either-sex for near 35 days. Deer hunting was one buck, October 15-November 15, from 1925 to 1950.

Three days either-sex hunting in 1951 was increased to near 35 days either-sex by 1956. Two deer either-sex was allowed in 1957 to 1960. The bag limit was one deer from 1961 to 1965. Hunting regulations since 1961 are given in Table 15.

Trend in Hunter Harvest

A summary of animals checked at Bonner checking station and calculated harvest based on statewide hunter questionnaire is given in Tables 16, 17, and 18.

The elk harvest in 1965 was indicated to be slightly greater than other years since 1962 by the number checked at the Bonner checking station. However, the statewide questionnaire indicated the lowest elk harvest in 1965 since 1960 in the Blackfoot unit.

The average number of elk checked at Bonner checking station from 1962 through 1965 was 32 percent less than the average checked from 1957 through 1961. The statewide questionnaire indicated: (1) 20 percent less elk taken on the average year 1962-65 compared to the 1957-61 period, (2) 27 percent less elk were taken on the average year 1962-65 compared to the average year 1957-61 in areas 28, 280, and 281, (3) 4 percent less elk were taken on the average year 1962-65 compared to the average year 1957-61 in Area 29, and (4) 47 percent less elk taken in area 29 in 1964-65 compared to 1962-63.

More deer of both species were checked at Bonner checking station in 1965 than since 1961. The hunter questionnaire indicated slightly more deer killed in 1965 than 1964 and 1962 but less than 1963. The average number of deer checked at Bonner from 1962-65 was 47 percent less than the average from 1957-61. The questionnaire results indicate 35 percent less deer taken from the Blackfoot Unit annually from 1962-65 than during the 1957-61 period. In areas 28, 280 and 281 the annual deer kill has been 32 percent less from 1962-65 than during the 1957-61 time period. In area 29 the annual deer kill has been 37 percent less from 1962-65 than the 1957-61 time period.

Trend in Hunting Pressure

A summary of hunters checked at Bonner checking station is shown in Table 16, and of calculated hunter numbers based on questionnaire returns in Tables 17 and 18.

The number of hunter trips checked at Bonner has increased in 1964 and 1965 over 1963. But the average number of hunter trips checked from 1962-65 was 25 percent less than the average from 1957-61.

Hunter questionnaire results indicate 20 percent less elk hunters in the Blackfoot Unit in 1965 than in 1964 but 14 percent more elk hunters on the average year 1962-65 than during the period 1957-61. The questionnaire results indicate six percent less deer hunters in 1965 than in 1964 and one percent less deer hunter annually from 1962-65 than the 1957-61 time period.

A summary of the source of successful hunters checked at Bonner follows:

	1951	1957	1961	1965
Missoula County	74%	83%	85%	90%
Other counties	23%	12%	8%	4%
Non-residents	3%	5%	7%	6%

The trend in souce of hunters appears to be toward more local resident hunters and less residents from other counties. The proportion of non-residents appears to be stabilizing.

Time Distribution of Kill

A summary of kill by weeks of the season from 1960 through 1965 follows:

	Elk	Mule Deer	W.T. Deer
First Day	19.1%	10.4%	14.2%
First Week	15.2%	12.6%	11.8%
Second Week	8.2%	13.2%	12.4%
Third Week	17.6%	15.8%	13.6%
Fourth Week	18.3%	21.2%	19.1%
Fifth Week	21.6%	26.9%	28.9%

The highest proportion of the deer harvest has been checked the last week of the season. The highest proportion of the elk harvest has been checked the first week of the season with some increase near the end. It is believed that weather conditions and hunting pressure influence the kill distribution to a high degree.

Trend in Species Harvested

The proportion of elk and deer species checked at the Bonner checking station the past few years is shown in Table 19.

Mule deer have made up a larger proportion of the deer checked at Bonner the past four years compared to prior periods.

The ratio of elk killed to deer killed has been toward a higher proportion of elk from 1961 to 1965 compared to prior periods of years checked at Bonner.

The proportion of elk and deer species reported killed by hunter questionnaire returns is shown in Table 20. This source of information indicates that mule deer have made up a smaller portion of the harvest during the period 1961-64 compared to a prior time period. Elk have made up a higher proportion of the kill during the 1961-64 period than they had during a prior period.

To determine trend in harvest and species composition within portions of hunting district 28 the animals checked at Bonner were tabulated by those reported killed west of the Clearwater River and east of this river. Results are given below:

	1957-59 Ave.		1960-62 Ave.		1963-65 Ave.	
	No.	%	No.	%	No.	%
Elk						
West of Clearwater	77	32	48	38	54	44
East of Clearwater	163	68	78	62	68	56
W.T. Deer						
West of Clearwater	146	44	70	50	75	64
East of Clearwater	186	56	77	50	42	36
Mule Deer						
West of Clearwater	90	38	52	46	62	65
East of Clearwater	146	62	61	54	33	35

A higher proportion of the harvest of both deer and elk has been reported killed in the portion of Area 28 west of the Clearwater River during the 1963-65 time period compared to prior time periods. Access in this portion of Area 28 has been improved by extensive logging road construction during the past ten years and it is believed this has increased game harvest.

The distribution of kill checked at Bonner in 1964 and 1965 is given in Table 21 for the various hunting districts of the Blackfoot Unit. The harvest of elk on the Blackfoot-Clearwater Game Range was indicated to be considerably less in 1965 than it had been in 1964.

Trend in Sex and Age of Elk and Deer Harvested

A summary of the sex and age of deer and elk checked at Bonner is given in Tables 22, 23, and 24.

A lower ratio of bulls to cows has been checked from 1962-1965 (86 bulls: 100 cows) compared to the 1958-61 time period (140 bulls:100 cows). During the 15 year period, 1950-65, a ratio of 101 bulls:100 cows was checked from the Blackfoot.

A lower ratio of calves to cows has been checked during the period 1962 to 1965 (48 calves:100 cows) than the prior period of years 1953-61 (53 calves: 100 cows). During the period 1950-65 calves were checked from the Blackfoot in a ratio of 49 per 100 cows.

Hunter questionnaire returns report an average of 91 bulls per 100 cows and 36 calves per 100 cows killed during the period 1962-1965. This source of information indicates a higher proportion of cows killed than were checked at the checking station during this time period. Note Table 25.

A higher ratio of buck mule deer to does has been checked at Bonner from 1962-64 (186 bucks:100 does) than during prior time periods. During the 15 year period 1951-65 bucks have been checked in a ratio of 155 per 100 does. The mule deer checked at Bonner from 1961-65 have been 51 percent antlered.

A higher ratio of mule deer fawns per 100 does has been checked at Bonner during the period 1962-65 than the period 1960-61; but the proportion of fawns checked from 1951 through 1959 was higher. During the 15 year period 1951-65, 48 fawns per 100 mule deer does have been checked at Bonner.

A higher ratio of buck white-tailed deer have been checked at Bonner from 1962-65 (154 bucks:100 does) than prior time periods. During the 15 year period 1951-65, 110 bucks per 100 doe white-tailed deer were checked.

Questionnaire returns indicate that 62% of the deer harvest from 1962 to 1965 in the Blackfoot were antlered. Note Table 26.

The harvest of white-tailed fawns was in a higher proportion from 1962-65 than the 1960-61 period, but lower than the 1956-59 period. During the 15 year period 1951-65, white-tailed fawns were harvested in a ratio of 64 fawns per 100 does.

It is believed that composition of the harvest is influenced by hunting conditions and hunter preference as well as herd composition. It is believed hunters are more selective in killing mule deer than other species.

Animals checked have been aged by dentition whenever possible. Note Table 27.

The proportion of yearling elk in the harvest was slightly higher during the period 1962-65 (55 yearlings per 100 older elk) than during period 1957-61 (47 yearlings per 100 older). Inversely, the proportion of "old" elk (smooth first molars) was lower the past four years than prior periods. The proportion of yearling bull elk was lower the past four year period, while the proportion of yearling cows killed increased.

The proportion of yearling mule deer in the harvest was higher during the period 1962-65 (65 yearlings per 100 older) than during the period 1957-61 (43 yearlings per 100 older). The proportion of "old" mule deer checked was 44% less the past four years than during the period 1957-61.

The proportion of yearling white-tailed deer in the harvest the past four years (60 yearlings per 100 older deer) was higher than during the period 1957-61 (54 yearlings per 100 older deer). The proportion of "old" white-tailed deer during the period 1962-65 (17 old per 100 prime) was 51 percent lower than during the period 1957-61 (35 old per 100 prime).

The trend toward younger animals in the harvest is believed to reflect more adequate harvest and more productive game herds in the Blackfoot Unit.

Checking station results have consistently shown that a higher proportion of young deer are taken during the first half of the season. The proportion

of deer by age class checked at Bonner in 1961 and 1965 is given below by portion of the season:

	Yearling per 100 prime		Old aged per 100 prime	
	1961	1965	1961	1965
White-tailed deer				
1st half of season	109	83	21	9
2nd half of season	48	35	31	15
Mule deer				
1st half of season	91	100	13	16
2nd half of season	40	35	18	9

A higher proportion of yearling deer have been checked the first half of the season each year. The proportion of "old" animals has been highest the last half of the season most years.

Checking Station Kill Versus Hunter Questionnaire

The percentage of the kill calculated from hunter questionnaire returns that is checked at Bonner checking station is given in Table 28.

It appears that the Bonner checking station provides a good index to the hunter harvest in area 28 with a range of checking between 25 to 33% of the elk and 15 to 26% of the deer killed.

Trend in Weights of Deer Harvested

Weights of deer checked with head and feet intact are given in Tables 29 and 30.

The weights of fawn mule deer were indicated to be slightly greater in 1965 than on other years when deer were weighed at Bonner. The average yearling and two year old mule deer buck was slightly lighter in 1965 than other years. Yearling and two year old does were found to be slightly heavier in 1965 than other years checked. Prime aged buck mule deer were slightly heavier in 1965 than 1964, but lighter than in 1962 and 1951.

The weights of white-tailed deer have varied between years checked to a degree that trend is not apparent. The weights of prime aged deer checked in 1962-64-65 has been lower than those checked in 1951. It seems probable that this is due in part to the fact that generally younger deer are being taken in recent years.

Little directional variation in deer weights between hunting districts was found, but sample sizes were small.

Bear Harvest

Numbers of bear reported killed in the Blackfoot Unit since 1961 are given in Table 31.

The number of bear reported killed has been higher since 1963 than prior years. During the past five years an average of 110 black bear have been killed yearly in the Unit. An average of 1.6 grizzly bear per year have been reported killed in the unit during the past five years.

The number of bear checked at Bonner checking station has varied. The highest number of bear checked was in 1964 (24 black bear).

Mountain Goat Harvest

Numbers of special permits and mountain goats killed are given in Table 32.

Success was low in both goat areas in 1964 and 1965. Early snow in 1965 made goat hunting very difficult or impossible in much of the area. The number of goats taken has been slightly higher during the period 1962-65 than prior years when permits were issued.

Moose Harvest

Three moose permits will be issued in the Garnet Range in 1966.

Lincoln Checking Station

A part-time checking station was operated east of Lincoln on State Highway 20. This station was located to contact hunters leaving the Blackfoot via Rogers or Fletcher Pass. Composition of harvest data was included in the Bonner checking station data. Dates of operation and the number of animals and hunters checked is given below:

	Elk	W.T. Deer	Mule Deer	Bear	Hunters
Oct. 24 - Oct. 31	34	7	49	0	446
Nov. 6 - Nov. 14	23	21	23	1	305
Nov. 20 - Nov. 21	8	9	18	0	182
Nov. 26 - Nov. 28	21	13	24	0	153
Total - 22 days	86	50	114	1	1086

The residence of hunters checked is given below:

	Great Falls-Vicinity	High-Line	Helena-Vicinity	Non-Residents
W.T. Deer	26	9	5	2
Mule Deer	65	12	25	9
Elk	34	19	17	5
Total	125	40	47	16

The reported location of kills is given in Table 33.

The results indicate that about 75% as many hunters and animals could be checked at this station as are checked at Bonner if it was operated on a similar time schedule.

Adjustments in Game Management

Large areas of relatively inaccessible country occurs in Area 28, 280, and 281. To provide a maximum of recreation hunting during the time when the bulls are bugling and the weather usually is still mild in the high country, it is suggested that as much of this area as possible be opened in mid-September.

Considering the fact that many winter ranges are still in relatively poor condition, it is recommended that a liberal harvest of deer and elk be made each year. It is suggested that the number of elk and deer checked at Bonner checking station be used as an index to kill, and the season be reopened if a minimum of 175 elk and 400 deer are not checked at Bonner during the regular hunt.

In some portions of the Blackfoot range conditions are very poor. In such areas reopenings after the animals are present on the individual "sore areas" may be needed to accomplish the reduction in animal numbers.

Recommendations

1. It is recommended that big game seasons open as early as possible and the season reopen in critical winter range areas if at least 175 elk and/or 400 deer have not been checked at Bonner checking station by the end of the regular season.

2. It is recommended that the Bonner and Lincoln checking stations be operated to obtain biological information on the big game herds and serve as a check on numbers harvested.

3. It is recommended that range transects be checked yearly to determine utilization and trend in big game winter range areas.

4. It is recommended that composition of the elk and deer herds be checked annually to determine productivity of the big game herds.

5. It is recommended that the U. S. Forest Service and Bureau of Land Management be requested to reserve forage for big game on critical winter ranges under their administration.

6. It is recommended that the possibilities for acquiring key game winter ranges now in private ownership be further investigated and these range lands be acquired when possible.

7. It is recommended that the U.S. Forest Service and Bureau of Land Management be requested to plant browse species palatable to game animals rather than trees on south and west exposures that are clear-cut logged.

Prepared by: Fred Hartkorn Approved by Wynn G. Freeman

Date: July 1, 1966

Table 1. Timber harvest in the Blackfoot Unit, 1961-1965*

Area Agency	Acres Logged	Miles permanent road built	Estimated acres logged in winter range
28			
Anaconda Co.	26,000	180	6,000
Northern Pacific	7,350	21	0
Forest Service	6,000	55	1,000
	39,350	256	7,000
29			
Anaconda Co.	2,000	40	600
Bureau Land Mgt.	2,500	58	500
Forest Service	2,725	38	500
	7,225	136	1,600
281			
Forest Service	3,225	79	500
Anaconda Co.	2,000	40	1,000
Bureau Land Mgt.	250	5	100
	5,475	124	1,600
Blackfoot Unit			
	52,050	516	10,200

*By larger land managing agencies; doesn't include small private lands.

Table 2. Aerial elk trend counts and distribution surveys, 1958-1966

Area and Locality	1958	1960	1962	1963	1964	1965	1966
Blackfoot Unit							
Hunting District 28, 280, 281							
O'Keefe to Gold Creek	58	48	0	18	--	31	16
Gold & Twin Creeks	9	4	0	0	--	5	7
Belmont-Blanchard	87	8	27	26	45	17	39
Lost Horse-Seeley Lake	22	--	16	10	7	36	11
Seeley Lake-Tote Road	43	--	7	7	7	6	13
B-C Game Range	59	119	47	26	87	119	86
Cottonwood-Monture	13	--	0	0	8	--	17
McCabe-Dick Creek	9	--	6	0	3	10	18
Ovando Mountain	110	84	51	55	69	141	58
North Fork-Coopers Lake	8	--	7	0	--	--	31
Markham-Mineral Mountain	51	50	21	--	24	64	19
Lincoln Canyon	11	7	17	--	1	19	7
Beaver Creek-Alice Creek --Not completely checked	--	--	20	--	128	53	143
Hunting District 29							
Flesher-Poorman	39	--	21	67	--	--	63
Nevada Creek	44	166	214	139	--	--	47
Sixmile Creek-McDonald Pass	13	22	19	55	--	--	8
Triangle*	29	210	119	121	--	--	33
W. Garnet Range	39	31	72	18	--	--	28

*Area bounded by Drummond-Helmville-Avon-Garrison roads.

Table 3. Big game road counts in Blackfoot Unit in 1962 and 1966
(Best evening counts during March)

Area	White-tailed deer		Mule deer		Elk	
	1962	1966	1962	1966	1962	1966
Clearwater Jct.- Placid Lake	39	23	18	11	0	0
Sperry Grade	11	10	15	6	8	3
North Fork-Dry Gulch	9	14	10	17	0	0
Helmville-Finn	0	8	72	19	0	6
Mineral-Markham Mtn.	14	26	56	43	13	0
Lincoln Canyon	72	78	7	10	16	0
Drummond-Piltzville	14	31	94	85	0	1
Total	159	190	272	191	37	10

Table 4. Sex and age of elk classified

Area Year	Mat. Bulls	Spikes	Cows	Calves	Bulls per 100 cows	Calves per 100 cows
Area 28						
1965	8	6	47	16	30	34
1966	13	16	162	72	18	44
Area 281						
1965	13	6	58	22	33	38
1966	10	14	156	67	15	43
Area 29						
1965	15	9	28	10	86	36
1966	14	12	52	30	50	58
Blackfoot Unit						
Ave. 1943-58	105	16	314	149	39	47
1961	14	5	57	36	33	63
1962	11	6	86	48	20	56
1964	15	19	99	48	34	48
1965	36	21	133	48	43	36
1966	37	42	370	169	21	46
Ave. 1961-1966	113	93	745	349	28	47

Table 5. Sex and age of mule deer classified

Area Year	Adults	Fawns	Fawns/100 adults
Area 28			
1963	68	42	62
1964	88	36	41
1965	62	28	45
1966	128	54	42
Ave. 1963-66	346	160	46
Area 29			
1963	102	49	48
1964	58	28	48
1965	97	42	43
1966	190	79	42
Ave. 1963-66	447	198	44
Area 281			
1963	26	16	62
1964	11	8	73
1965	60	16	27
1966	54	31	57
Ave. 1963-66	151	71	47
Blackfoot Unit			
1943-1948	666	500	75
1956-1960	1159	515	44
1961	45	29	64
1962	387	180	47
1963	196	107	55
1964	157	72	46
1965	219	86	39
1966	372	164	44
Ave. 1961-66	1376	638	46

Table 6. Sex and age of white-tailed deer classified

Area Year	Adults	Fawns	Fawns/100 Adults
Area 28			
1963	37	17	46
1964	99	56	57
1965	135	46	34
1966	173	97	56
Ave. 1963-66	444	216	49
Area 29			
1964	19	14	74
1965	19	7	37
1966	62	25	40
Ave. 1964-66	100	46	46
Area 281			
1963	69	36	52
1964	15	7	47
1965	5	2	40
1966	142	70	49
Ave. 1963-66	231	115	50
Blackfoot Unit			
Ave. 1936-50	768	565	74
Ave. 1956-60	1675	672	40
1961	55	47	86
1962	405	184	45
1963	106	53	50
1964	133	77	58
1965	159	55	35
1966	377	192	51
Ave. 1961-66	1235	608	49

Table 7. Young:adult female ratio of elk and deer checked at Bonner Station

Year	Elk Calves:100 cows	White-tailed deer Fawns:100 does	Mule deer Fawns:100 does
1951-61 Ave.	50	62	51
1962	43	71	43
1963	45	78	32
1964	59	77	52
1965	47	70	43
1962-65 Ave.	48	73	41

Table 8. Blackfoot tagged elk and recovery to date (1966)

	Number tagged	Number reported killed	% return to date
Native elk trapped, tagged and released 1951-1959	445	170	38
Native elk trapped, tagged and relocated to B-C Game Range 1951-1956	150	38	25
Used in elk nutrition study and released on B-C Game Range 1952-56	114	42	37
Yellowstone Park elk released on B-C Game Range 1953-1964	298	113	38
Yellowstone Park elk released in the Garnet Range 1950-1963	160	36	23
Total	1167	399	34

Table 9. Tagged elk returns from Blackfoot Unit by sex and age classes

Sex and Age	No. Tagged	No. Returns	% Return
Male calves	161	56	35
Female calves	188	61	32
Unsexed calves	35	6	17
Total calves	384	123	32
Cows	441	160	36
Spike bulls	69	25	36
Mature bulls	67	32	48
Total males	297	113	38
Total females	629	221	35
Total elk	961	340	35

Table 10. Recovery of elk tags by year periods following release (based on 953 elk tagged from 1951-1964 in Blackfoot Unit)

Year after release	Number reported killed	Percent reported killed
First	143	15.0
Second	67	7.0
Third	57	6.0
Fourth	26	2.7
Fifth	15	1.6
Sixth	15	1.6
Seventh	11	1.1
Eighth	3	.3
Ninth	2	.2
Tenth	1	.1
Eleventh to Fourteenth	0	0.0

Table 11. Distance from release sites that tagged elk were reported killed in the Blackfoot area

	Recoveries	Under 5 mi. No.	%	5 - 20 mi. No.	%	Over 20 mi. No.	%	Ave. movement miles
Native elk trapped and released at same site								
Bulls	61	24	39	23	38	14	23	11.9
Cows	110	60	55	48	44	3	2	7.5
Total	171	84	49	71	42	17	9	9.1
Yellowstone Park elk released on B-C Game Range								
Bulls	25	16	64	5	20	4	16	8.4
Cows	52	34	65	9	17	9	17	7.8
Total	77	50	65	14	18	13	17	8.0
Nutrition study elk								
Bulls	11	8	73	2	18	1	9	6.4
Cows	30	24	80	5	17	1	3	4.9
Total	41	32	78	7	17	2	5	5.3
Trapped and relocated on B-C Game Range								
Bulls	15	5	33	5	33	5	33	13.3
Cows	20	8	40	10	50	2	20	7.3
Total	35	13	37	15	43	7	20	9.9
Yellowstone Park elk released in Garnet Range								
Bulls	1	1	100	0	0	0	0	2.5
Cows	11	8	73	2	18	1	9	5.4
Total	12	9	75	2	17	1	8	5.2

Table 12. Age at which tagged calves were killed

Age	Number male calves	Number female calves
$1\frac{1}{2}$	24	13
$2\frac{1}{2}$	10	9
$3\frac{1}{2}$	6	16
$4\frac{1}{2}$	6	3
$5\frac{1}{2}$	3	4
$6\frac{1}{2}$	1	1
$7\frac{1}{2}$	2	2
$8\frac{1}{2}$	0	0
$9\frac{1}{2}$	0	1
$10\frac{1}{2}$	0	1
Average age to date	2.84 years	3.52 years

Table 13. Grass condition and trend on elk ranges in the Blackfoot Unit

Sample Unit	Spec.	Year	No. Plants	Form Class - % Normal	Young	HC & CE	Condi. rating	Density Index(ft.)	Max.leaf Ht.(ft.)	% with seed	% utilization*	Pellet groups /acre deer	elk
Hunting Dist.28													
B-C Game Range (upper plot)													
#245	Fesc	1957	100	36	15	49	Fair	1.26	.98	37	--		
245	Fesc	1961	100	17	3	80	Poor	1.20	1.03	21	90		
245	Fesc	1962	100	43	0	57	Poor	1.31	1.10	86	35		
245	Fesc	1963	100	35	3	62	Poor	.97	1.04	18	40	0	120
245	Fesc	1964	100	31	1	68	Poor	.84	1.07	39	55	10	180
245	Fesc	1965	100	16	1	83	V.poor	.99	1.00	16	47	0	160
245	Fesc	1966									33	0	180
B-C Game Range (lower plot)													
#274	Fesc	1957	100	47	1	52	Fair	1.96	1.09	7			
274	Fesc	1961	100	35	0	65	Poor	1.61	1.42	72	43		
274	Fesc	1962	100	61	1	38	Good	1.52	1.48	98	--		
274	Fesc	1963	100	71	3	26	Good	1.18	1.37	21	7	0	40
274	Fesc	1964	100	80	2	18	Excel.	1.03	1.48	36	13	0	20
274	Fesc	1965	100	64	3	33	Good	.96	1.34	43	12	0	40
274	Fesc	1966									2	3	18
Hunting Dist.29													
Baldy Mtn. (So. of Lincoln)													
#212	Fesc	1957	100	18	14	68	Poor	.56	.76	27			
212	Fesc	1962	100	54	4	42	Fair	.52	1.02	20	2	20	20
212	Fesc	1963	100	38	4	58	Fair	.40	1.10	32	6	0	100
212	Fesc	1964	100	82	0	18	Excel.	.36	1.17	72	12	20	95
212	Fesc	1965	100	68	10	22	Good	.53	1.01	11			
212	Fesc	1966									8	28	82
Hunting Dist.281													
Alice Creek (Lewis & Clark Pass)													
# 25	Fesc	1962	50	0	12	88	V.poor	.98	.68	4	Heavy		
25	Fesc	1963	50	2	0	98	V.poor	1.04	.73	80	2	0	20
25	Fesc	1964	100	10	3	77	Poor	.80	.75	3	73	0	820
25	Fesc	1965	100	34	10	56	Fair	1.07	.73	6	31	10	135
25	Fesc	1966									38	0	266
Alice Creek (Telephone Ridge)													
# 26	Fesc	1965	43	19	9	72	Poor	.98	.57	7			
26	Feid		44	68	11	21	Good	.58	.26	45			
26	Agsp		13	54	7	39	Good	.37	.84	77			
		1966									Fesc 40 Feid 18 Agsp 10	14	180

*Spring reading

Table 14. Trend in browse condition and utilization in Blackfoot Unit

Area	Plot No.	Spec.	Percent plants severely hedged 1958	1962	1966	Percent leaders used 1963	1964	1965	1966	Ave. '63-66	Percent decadent plants 1958	1962	1966	Pellet groups per acre deer 1958	1962	1966	elk 1958	1962	1966
28																			
Rattlesnake Random		Amal	70	30	61	27	90	88	74	70	74	40	45	174	60	460	0	0	0
TV Mountain	935	Amal			20	--	39	27	12	26	--	--	44	--	--	20	--	--	40
Marco Flats		Amal	--	36	56	38	59	69	2	42	--	56	72	--	100	10	--	10	0
Twin Creek		Amal		50	60	16	14	68	4	26		80	64		60	100		20	10
McNamara		Amal	50	8	20	24	15	59	2	25	48	44	20	--	20	6	--	0	0
Sheep Flats		Amal	70	68	88	43	95	89	78	76	26	76	80		220	200		10	10
Camp Nine	953	Amal	60	44	32	68	90	71	61	73	64	32	44	392	268		0	0	
Camp Nine		Amal	--	8	36	56	88	67	66	69	--	28	44	--	180	110	--	0	10
Salmon Lake Hills	517	Amal	90	44	56	38	81	88	62	67	60	56	68	614	200	180	21	4	0
Placid Lake Random		Prunus	--	25	0	17	67	25	14	31	--	55	10	--	54	6	--	34	26
Oscars Landing	952	(Acer (Amal	-- --	60 52	90 70	-- --	90	90 72	90 90	90 84	-- --	70 64	80) 70)	--	40	154	--	20	80
B-C Game Rge.	954	Amal	25	28	18	3	51	60	43	39	25	12	32	36	10	36	348	30	226
B-C Game Rge.	817	Amal	55	16	24	27	35	54	75	48	45	18	16	20	30	10	60	90	200
Shanley Cr.	FS#1	Amal		84	60	20	59	10	4	23	--	80	72	--	110	10	--	170	40
Ovando Mtn.		Amal	30	12	48	22	66	80	69	59	70	60	44	14	40	10	261	320	130
Woodchuck Gul.	957	Amal		76	12	1	35	37	4	19	--	80	20	--	60	40	--	180	10
McCabe Cr.		Acer	--	60	40	88	84	34	60	67	--	44	49	--	12	0	--	200	86
N.Fk.-Dry Fork Bottoms	#1	Salix		0	4	1		--	12	7		16	8		0	0		40	80
N.Fk.-Dry Fork Bottoms	#2	Salix		4	20	74	--	--	27	51		8	12		0	0		140	60
N.Fk.-Sixmile Bridge		Acer		24	8	5			31	18		24	16	--	0	20	--	200	60
Average			50	36	39	32	62	60	42	48	52	51	43	210	95	86	173	103	71
281																			
Lower Lincoln Canyon	958	Amal	95	68	76	48	77	90	85	75	65	84	28	424	540	--	0	0	--
Upper Lincoln Canyon	DL-6	Amal		52	32	20	43	31	25	30		70	60			--			--
Mineral Markham	806	Amal	100	52	32	39	80	73	50	61	100	72	48	131	240	210	21	60	40
McDermott Cr.	FS	Acer		52	28	15	72	--	29	39	--	76	44	--	0	24	--	120	80
McDermott Cr.	FS	Amal		16	12	--	46	--	13	30	--	56	44						
Average			98	48	36	31	64	65	40	47	85	72	45	277	390	117	21	90	60

Table 14. continued

Area	Plot No.	Spec.	Percent plants severely hedged 1958	1962	1966	Percent leaders used 1963	1964	1965	1966	Ave. '63-66	Percent decadent plants 1958	1962	1966	Pellet groups per acre deer 1958	1962	1966	elk 1958	1962	1966
29																			
Cramer Creek	808	Prunus	27	15	10	-1	1	-1	2	1	76	56	15	0	20	10	0	0	0
Rattler Gul.	600	Purshia	100	96	96	58	55	86	56	64	70	92	92	131	100	100	0	0	0
Hoover Creek	516	Purshia	81	92	100	78	80	89	50	74	70	88	96	217	540	300	0	0	0
Carter Creek	527	Purshia	70	80	96	62	53	80	56	63	72	100	96	44	160	40	0	0	0
Warm Springs Creek	528	Purshia	90	100	100	53	55	72	16	49	60	92	100	29	140	10	0	0	0
Poorman Cr.	#40	Amal	98	80	32	2	37	82	12	33	--	64	40	--	--	--	-	-	-
Poorman Cr.	#36	Amal	98	24	32	14	58	83	63	55		52	52	360		--			-
Nevada Cr.	D4-21	Prvi			24	--	--	37	49	43			8	--		9			0
Nevada Cr.	959	Amal		60	30	1	68	82	40	48		60	30	--	70	0	-	0	40
Nevada Cr.	D4-11	Amal			72				24	24			76			180			0
Nevada Cr.	D4-9	Amal			88				59	59			64			238			0
Nimrod		Putr	--	96	40	64	89	90	70	78	--	72	44	--	300	140	-	0	0
Average			81	71	60	37	55	70	41	49	70	75	59	156	190	114	0	0	5

Table 15. Big game season regulations in the Blackfoot Unit 1961-1965

Area Year	Deer	Elk
28 - Blackfoot		
1961	Oct. 15 - Dec. 3; 1 either sex	Oct. 15 - Dec. 3; either sex
1962	Oct. 21 - Dec. 2; 1 either sex	Oct. 21-Dec. 2; either sex
B-C Game Range	Oct. 21 - Nov. 4; 1 either sex	Oct. 21-Nov. 4; either sex
Salmon Lake area	Dec. 3 - Dec. 23; 2 either sex	
1963	Oct. 20-Nov. 24; 1 either sex	Oct. 20-Nov. 24; either sex
B-C Game Range	Oct. 20-Nov. 3; 1 either sex	Oct. 20-Nov. 3; either sex
1964	Oct. 18-Nov. 22; 1 either sex	Oct. 18-Nov.22; either sex
B-C Game Range	Oct. 18-Nov. 1; 1 either sex	Oct. 18-Nov. 1; either sex
1965	Oct. 24-Nov. 28; 2 either sex	Oct. 24-Nov. 28; either sex
B-C Game Range	Oct. 24-Nov. 7; 2 either sex	Oct. 24-Nov. 7; either sex
29 - Garnet Range		
1961	Oct. 15-Dec. 3; 1 either sex	Oct. 14-Dec. 3; either sex
1962	Oct. 21-Dec. 2; 1 either sex	Oct. 21-Dec. 2; either sex
1963	Oct. 20-Nov.24; 1 either sex	Oct. 20-Nov. 24; either sex
1964	Oct. 18-Nov. 22; 1 either sex	Oct. 18 - Nov.22; either
1965	Oct. 24-Nov. 28; 2 either sex	Oct. 24-Nov. 14; either sex Nov. 15-Nov. 28; Branch antlered
280 - Blackfoot back country		
1961	Sept. 15-Dec. 3; 1 either sex	Sept. 15-Dec. 3; either
1962	Sept. 15-Dec. 2; 1 either sex	Sept. 15-Dec. 2; either
1963	Sept. 15-Nov. 24; 1 either sex	Sept. 15-Nov. 24; either
1964	Sept. 15-Nov. 22; 1 either sex	Sept. 15-Nov. 24; either
1965	Sept. 15-Nov. 28; 2 either sex	Sept. 15-Nov. 28; either
281 - Upper Blackfoot		
1962	Oct. 21-Dec. 2; 1 either sex	Oct. 21-Dec. 2; either
1963	Oct. 20-Nov. 24; 1 either sex	Oct. 20-Nov. 24; either
1964	Oct. 18-Nov. 22; 1 either sex	Oct. 18-Nov. 22; either
1965	Oct. 24-Nov. 28; 2 either sex	Oct. 24-Nov. 28: either

Table 15. Continued.

Area Year	Deer	Elk
290 - Special Archery Area		
1961	Sept. 15-Nov. 19; 1 either sex	Closed
1962	Sept. 15-Nov. 20; 1 either sex	Closed
1963	Sept. 15-Nov. 24; 1 either sex	Closed
1964	Sept. 13-Nov. 22; 1 either sex	Closed
1965	Sept. 26-Nov. 28; 1 either sex	Closed

Table 16. Big game and hunters checked from the Blackfoot drainage at Bonner Station

Year	Elk	W.T. Deer	Mule Deer	Total Deer	Black bear	Hunter trips
1950-54 Ave.	128	213	128	341	5	2819
1957-61 Ave.	223	352	275	627	5	2778
1962	133	170	164	334	5	2184
1963	156	125	170	295	5	1784
1964	155	174	99	273	27	2063
1965	162	215	205	420	1	2349
1962-65 Ave.	152	171	160	331	10	2095

Table 17. Calculated elk harvest in the Blackfoot Unit from state-wide questionnaire

Area Year	Elk harvested by: Res.	Non-res.	Total	Area Sq. mi.	Kill Sq. mi.	No. Hunters	% Hunting success
28*							
1957			850	1490	.57	2881	30
1958			930	1490	.62	2888	32
1959			740	1490	.50	3318	22
1960			401	1490	.27	2804	14
1961			1007	1490	.68	3141	32
1957-61 ave.			786	1490	.53	3006	26
1962	416	47	463	1490	.31	2858	16
1963	531	75	606	1490	.41	3812	16
1964	617	64	681	1490	.46	3349	20
1965	486	60	546	1490	.37	2685	20
1962-65	513	62	575	1490	.39	3176	18
*Original area 28 which now includes 280 and 281							
28							
1962	301	24	325	870	.37	1456	22
1963	334	8	342	870	.39	2166	16
1964	420	21	441	870	.51	2200	20
1965	347	12	359	870	.41	1669	22
1962-65 ave.	351	16	367	870	.42	1873	20
29 1/							
1957			385	1280	.30	1634	24
1958			360	1280	.28	1525	24
1959			315	1280	.25	1309	24
1960			222	1280	.17	1011	22
1961			329	1280	.26	1093	30
1957-61 ave.			322	1280	.25	1314	25
1962	401	8	409	1430	.29	2276	18
1963	379	17	396	1430	.28	2813	14
1964	258	4	262	1430	.18	1306	20
1965	162	12	174	1430	.12	1045	17
1962-65 ave.	300	10	310	1430	.22	1860	17
1/ Portion south of Lincoln added in 1962. Includes area 290.							
280							
1962	29	23	52	220	.24	276	19
1963	106	50	156	220	.71	434	36
1964	86	30	116	220	.53	441	26
1965	59	36	95	220	.43	300	32
1962-65	70	35	105	220	.48	363	29
281							
1962	86	0	86	400	.22	1126	8
1963	91	17	108	400	.27	1212	9
1964	111	13	124	400	.31	967	13
1965	80	12	92	400	.23	716	13
1962-65 Ave.	92	11	103	400	.26	1005	10

Table 17. (Continued)

Area Year	Elk harvested by: Res.	Non-res.	Total	Area Sq. mi.	Kill Sq. mi.	No. Hunters	% Hunting success
Blackfoot Unit							
1957			1235	2770	.45	4515	27
1958			1290	2770	.47	4413	29
1959			1055	2770	.38	4627	23
1960			623	2770	.22	3815	16
1961			1346	2770	.49	4234	32
1957-61 ave.			1110	2770	.40	4321	26
1962	817	55	872	2920	.30	5134	17
1963	910	92	1002	2920	.34	6625	15
1964	875	68	943	2920	.32	4655	20
1965	648	72	720	2920	.25	3730	19
1962-65 ave.	813	72	884	2920	.30	5036	18

*Includes area 280, 281, or 421 on various years.
1.Poorman-Fletcher Pass portion added in 1962. Includes area 290.

Table 18. Deer harvest in Blackfoot Unit based on state-wide questionnaire

Area / Year	Deer harvest by: Res.	Non-res.	Total	Area sq. mi.	Kill sq. mi.	No. hunters	% hunter success
28*							
1957			2427	1490	1.63	2649	92
1958			2615	1490	1.76	2997	87
1959			1860	1490	1.25	2747	68
1960			1308	1490	.88	2960	44
1961			1770	1490	1.19	2784	64
1957-61 ave.			1996	1490	1.34	2827	71
1962	1017	40	1057	1490	.71	2382	44
1963	1471	99	1570	1490	1.05	3055	51
1964	1351	101	1452	1490	.97	2970	49
1965	1245	105	1351	1490	.91	2753	49
1962-65 ave.	1271	86	1357	1490	.91	2790	49
*Original area 28 which now includes area 280 and 281							
28							
1962	731	24	755	870	.87	1684	45
1963	1016	0	1016	870	1.17	2071	49
1964	873	36	909	870	1.04	2173	42
1965	994	35	1029	870	1.18	2049	50
1962-65	904	24	928	870	1.07	1994	47
29 1/							
1957			2913	1280	2.28	2771	105
1958			2158	1280	1.68	1730	125
1959			1333	1280	1.04	1725	77
1960			1431	1280	1.12	2195	65
1961			1209	1280	.94	1071	113
1957-61 ave.			1809	1280	1.41	1898	95
1962	1176	31	1207	1430	.84	2112	57
1963	1259	17	1276	1430	.89	2204	58
1964	938	24	962	1430	.67	1674	58
1965	1034	47	1081	1430	.76	1608	67
1962-65	1102	30	1132	1430	.79	1900	60
1/ Portion south of Lincoln added in 1962. Includes area 290							
280							
1962	57	8	65	220	.30	160	41
1963	61	66	127	220	.58	237	54
1964	158	45	203	220	.92	203	100
1965	69	58	128	220	.58	259	49
1962-65	86	44	130	220	.59	215	60
281							
1962	229	8	237	400	.59	538	44
1963	394	33	427	400	1.07	747	57
1964	320	20	340	400	.85	594	57
1965	182	12	194	400	.49	445	44
1962-65 ave.	281	18	299	400	.75	581	52

Table 18. (Continued)

Area Year	Deer harvest by: Res.	Non-res.	Total	Area sq. mi.	Kill sq. mi.	No. hunters	% hunter success
Blackfoot Unit							
1957			5340	2770	1.93	5420	99
1958			4773	2770	1.72	4727	101
1959			3193	2770	1.15	4472	71
1960			2739	2770	.99	5155	53
1961			2979	2770	1.08	3855	77
1957-61 ave.			3805	2770	1.37	4726	81
1962	2193	71	2264	2920	.78	4494	50
1963	2730	116	2846	2920	.97	5259	54
1964	2289	125	2414	2920	.83	4644	52
1965	2279	152	2432	2920	.83	4361	56
1962-65	2373	116	2489	2920	.85	4690	53

Table 19. Species composition - harvest checked at Bonner

Blackfoot Unit	% Mule deer	% White-tailed deer	Ratio Elk:100 deer
1950-54 ave.	37	63	38
1957-60 ave.	44	56	33
1961	44	56	48
1962	49	51	40
1963	58	42	53
1964	36	64	49
1965	46	54	42
1961-65 Ave.	47	53	46

Table 20. Species composition of Blackfoot big game harvest, from questionnaire

Area Year	% White-tailed	% Mule deer	Ratio Elk:100 deer
28			
1957-60	55	45	36
1961	61	39	57
1962	69	31	45
1963	55	45	35
1964	63	37	50
1961-64 Ave.	61	39	49
1964	66	34	40
280			
1962	43	57	80
1963	14	86	124
1964	35	65	57
1962-64 ave.	28	72	82
1965	36	64	74
281			
1962	42	58	36
1963	52	48	25
1964	41	59	42
1962-64 ave.	46	54	33
1965	43	57	47
29			
1957-60 ave.	27	73	18
1961	19	81	27
1962	32	68	34
1963	19	81	36
1964	30	70	28
1961-64 ave.	25	75	31
1965	28	72	16
Blackfoot Unit			
1957-60 ave.	41	59	27
1961	44	56	45
1962	46	54	40
1963	38	62	38
1964	45	55	42
1961-64 ave.	43	57	41
1965	46	54	30

Table 21. Distribution of elk and deer harvest checked through Bonner station in 1964 and 1965

Species Year	B-C Game Range No.	B-C Game Range Percent	Rest of Dist.28 No.	Rest of Dist.28 Percent	Dist. 29 No.	Dist. 29 Percent	Dist. 280 No.	Dist. 280 Percent	Dist. 281 No.	Dist. 281 Percent	Total No.
Elk											
1964	51	34	58	39	31	21	3	2	5	3	148
1965	8	5	112	71	24	15	5	3	9	6	158
Mule deer											
1964	0	0	55	59	30	33	0	0	7	8	92
1965	4	2	110	54	75	37	2	0	14	7	205
W.T. deer											
1964	17	11	89	55	50	31	0	0	5	3	161
1965	10	4	142	66	49	23	0	0	14	7	215

Table 22. Trend in sex and age of elk harvested in Blackfoot Unit; Bonner checking station sample

Year	Bulls No.	Bulls %	Cows No.	Cows %	Calves No.	Calves %	Total	Ratio/100 ad. females Ad. males	Ratio/100 ad. females Young
1950-53	214	41	189	36	122	23	525	113	65
1954-57	216	38	260	45	97	17	573	83	37
1958-61	250	40	179	39	95	20	524	140	53
1962	56	42	54	41	23	17	133	104	43
1963	60	39	66	42	30	19	156	91	45
1964	40	32	54	43	32	25	126	74	59
1965	85	35	106	44	50	21	241	80	47
1962-65	241	37	280	43	135	20	656	86	48
1950-65	921	40	908	40	449	20	2278	101	49

Table 23. Trend in sex and age of mule deer harvested in Blackfoot Unit; Bonner checking station sample

Year	Bucks No.	Bucks %	Does No.	Does %	Fawns No.	Fawns %	Total	Ratio/100 ad. females Ad. males	Ratio/100 ad. females Young
1951-55	116	49	78	32	45	19	239	149	58
1956-59	528	46	393	35	218	19	1139	134	55
1960-61	214	56	127	33	42	11	383	169	33
1962	90	55	51	31	22	14	163	176	43
1963	95	56	57	34	18	11	170	167	32
1964	55	59	25	27	13	14	93	220	52
1965	181	58	93	30	40	12	314	195	43
1962-65	421	57	226	31	93	12	740	186	41
1951-65	1279	51	824	33	398	16	2501	155	48

Table 24. Trend in sex and age of white-tailed deer harvested in Blackfoot Unit; Bonner checking station sample

Year	Bucks		Does		Fawns			Ratio/100 ad. females	
	No.	%	No.	%	No.	%	Total	Ad. males	Young
1951-55	253	37	320	47	110	16	683	79	34
1956-59	527	37	499	36	387	27	1413	106	78
1960-61	104	44	77	33	55	23	236	135	30
1962	85	49	51	30	36	21	172	167	71
1963	52	42	41	33	32	25	125	127	78
1964	64	39	56	34	43	27	163	114	77
1965	139	53	73	27	51	20	263	190	70
1962-65	340	47	221	31	162	22	723	154	73
1951-65	1224	40	1117	37	714	23	3055	110	64

Table 25. Composition of the Blackfoot Unit elk harvest by sex and age class from questionnaire data

Hunting District / Year	Total No.	% Bulls	% Spikes	% Cows	% Calves	Bulls/* 100 cows	Spikes/ 100 bulls	Calves/ 100 cows
28								
1962	326	35	11	44	9	104	32	20
1963	343	40	9	38	13	128	22	35
1964	435	26	15	40	19	105	59	48
1965	359	28	14	43	15	96	50	34
29								
1962	410	28	10	44	18	88	37	40
1963	397	21	10	54	15	58	46	29
1964	256	21	12	47	20	71	55	43
1965	175	34	10	39	17	113	31	44
280								
1962	52	27	15	42	15	100	57	36
1963	156	35	25	30	10	200	70	33
1964	116	37	16	36	10	147	44	29
1965	95	13	13	44	30	57	100	69
281								
1962	86	--	34	50	16	67	--	33
1963	107	--	14	86	--	--	--	--
1964	121	19	8	46	26	59	43	57
1965	93	29	10	52	9	75	33	19
Blackfoot Unit								
1962	874	28	13	44	15	96	46	34
1963	1003	24	15	48	13	81	63	27
1964	928	25	14	42	19	92	54	46
1965	722	27	12	43	18	91	45	39
1962-65 Ave.	882	26	14	44	16	91	54	36

*Incl. spikes

Table 26. Composition of the Blackfoot deer harvest, based on questionnaire returns

Area	Year	Antlered		Antlerless	
		No.	%	No.	%
28	1962	424	61	272	39
	1963	701	70	305	30
	1964	478	54	412	46
	1965	599	59	422	41
	1962-65	2202	61	1411	39
29	1962	761	64	424	36
	1963	694	61	435	39
	1964	592	62	366	38
	1965	679	64	382	36
	1962-65	2726	63	1607	37
280	1962	29	44	37	56
	1963	78	62	48	38
	1964	70	64	39	36
	1965	76	59	52	41
	1962-65	253	59	176	41
281	1962	137	58	100	42
	1963	238	55	191	45
	1964	187	63	109	37
	1965	130	67	64	33
	1962-65	692	60	464	40
Blackfoot Unit	1962	1351	62	833	38
	1963	1711	64	979	36
	1964	1327	62	926	38
	1965	1484	62	920	38
	1962-65	5873	62	3658	38

Table 27. Trend in age of elk and deer harvested in the Blackfoot Unit based on animals aged by dentition at checking stations.

	No. Yearlings	No. Prime	No. Old	Total	Ratios: Yearlings per 100 prime & old	Ratios: Old per 100 prime
Elk						
1957-61						
Male	85	100	5	190	81	5
Females	35	134	18	187	23	13
Total	120	234	23	377	47	10
1962						
Male	13	20	2	35	59	6
Female	7	17	2	26	37	8
Total	20	37	4	61	49	7
1963						
Male	16	20	0	36	80	0
Female	7	20	2	29	35	10
Total	23	40	2	65	58	5
1964						
Male	14	23	1	38	58	4
Female	13	21	2	36	57	10
Total	27	44	3	74	57	7
1965						
Male	23	26	2	51	82	8
Female	12	29	3	44	38	10
Total	35	55	5	95	58	9
1962-65						
Male	66	89	5	160	70	6
Female	39	87	9	135	41	11
Total	105	176	14	295	55	8
Mule Deer						
1957-61						
Male	147	231	52	430	52	23
Female	64	152	51	267	32	34
Total	211	383	103	697	43	27
1962						
Male	38	35	7	80	90	10
Female	16	19	4	39	70	11
Total	54	54	11	119	83	10
1963						
Male	39	47	0	86	83	0
Female	13	18	6	37	54	19
Total	52	65	6	123	73	5

Table 27. (Continued)

	No. Yearlings	No. Prime	No. Old	Total	Ratios: Yearlings per 100 prime & old	Ratios: Old per 100 prime
Mule deer (cont'd)						
1964						
Male	29	22	3	54	116	14
Female	6	8	2	16	60	25
Total	35	30	5	70	100	17
1965						
Male	42	89	6	137	44	7
Female	21	45	6	72	41	13
Total	63	134	12	209	43	9
1962-65						
Male	148	193	16	357	71	8
Female	56	90	18	164	52	20
Total	204	283	34	521	64	12
White-tailed deer						
1957-61						
Male	173	211	56	440	65	27
Female	118	186	84	388	44	45
Total	291	397	140	828	54	35
1962						
Male	29	40	5	74	64	7
Female	15	20	5	40	60	14
Total	44	60	10	114	63	10
1963						
Male	17	15	8	40	74	25
Female	10	12	5	27	59	23
Total	27	27	13	67	68	24
1964						
Male	32	26	4	62	107	15
Female	14	24	2	40	54	8
Total	46	50	6	102	82	12
1965						
Male	29	83	5	117	33	6
Female	23	23	7	53	77	30
Total	52	106	12	170	44	11
1962-65						
Male	107	164	22	293	58	13
Female	62	79	19	160	63	24
Total	169	243	41	453	60	17

Table 28. Proportion of Blackfoot deer and elk harvest checked at Bonner station

Year	Deer		Elk	
	Area 28	Area 29	Area 28	Area 29
1957-61 Ave.	24%	10%	29%	8%
1962	23	10	25	9
1963	15	9	31	8
1964	18	8	26	12
1965	26	11	33	14

Table 29. Weights of mule deer checked at Bonner

Year	Males			Females		
Age	Ave.	No.	Range	Ave.	No.	Range
1951						
1½	130	1	130			
2½	144	4	94-185			
Prime	188	10	140-215	100	1	100
1962						
½	61.3	3	55-65	51.6	5	46-57
1½	106.1	11	87-126	91.0	13	86-102
2½	141.7	7	120-162	105.7	6	90-130
Prime	162.9	9	130-195	119.7	3	114-125
1964						
½	56.3	4	44-64	54.7	5	44-62
1½	106.8	12	98-117	91.0	2	85-97
2½	138.4	5	112-168	101.5	2	95-108
Prime	157.4	5	145-180	118.0	2	112-124
Old	147.5	2	105-190			
1965						
½	63.3	11	70-54	60.5	13	68-52
1½	102.4	29	125-83	94.1	15	114-86
2½	128.8	17	114-161	106.6	14	82-128
Prime	160.2	45	117-213	111.3	14	101-137
Old	195.5	2	192-199	110.0	4	100-114

Table 30. Weights of white-tailed deer checked at Bonner

Year	Males			Females		
Age	Ave.	No.	Range	Ave.	No.	Range
1951						
½	60.0	1	60	56.5	10	40-65
1½	108.3	3	100-115	95.6	5	85-100
2½	136.2	4	120-140	106.3	4	100-115
Prime	176.5	16	165-215	125.0	3	115-140
1962						
½	61.3	14	39-71	57.8	5	54-60
1½	113.2	13	93-134	99.1	10	92-111
2½	139.0	3	126-146	99.0	3	98-101
Prime	156.5	14	130-176	101.3	8	94-113
1964						
½	56.5	11	48-66	52.5	13	39-59
1½	107.8	19	92-137	90.5	4	76-99
2½	128.2	5	113-136	93.0	1	93
Prime	170.6	8	140-198	112.3	4	108-119
Old	187.7	3	180-198	-	0	-
1965						
½	60.9	21	50-76	54.9	13	45-67
1½	107.2	20	87-122	98.0	19	90-110
2½	140.3	11	117-177	110.2	9	100-128
Prime	163.9	61	129-200	112.5	12	97-127
Old	153.2	4	97-190	107.0	7	94-117

Table 31. Bear harvest in the Blackfoot Unit based on hunter questionnaire results

Area	Year	Black Bear Killed	Grizzly Bear Killed
28	1961	0	0
	1962	57	0
	1963	30	0
	1964	102	6
	1965	44	0
	Ave.	29	1+
29	1961	61	0
	1962	0	0
	1963	76	0
	1964	23	0
	1965	30	0
	Ave.	38	0
280	1961	13	2
	1962	14	0
	1963	0	0
	1964	20	0
	1965	53	0
	Ave.	20	-1
281	1962	0	0
	1963	15	0
	1964	10	0
	1965	0	0
	Ave.	8	0
Blackfoot Unit	1961	74	2
	1962	71	0
	1963	121	0
	1964	155	6
	1965	127	0
	Ave.	110	1.6

Table 32. Blackfoot mountain goat harvest, 1958-1965

Area	Year	Number Permits	No. Goats Killed	Males	Females
280 North Blackfoot	1958	30	9	6	3
	1959	(Part of South Fork unlimited permit area)			
	1960	10	4	3	1
	1961	12	5	4	1
	1958-60-61 ave.	17	6	13	5
	1962	25	8	3	5
	1963	25	7	4	2
	1964	25	10	7	2
	1965	15	0	0	0
	1962-65 ave.	23	6.3	14	9
281 Rattlesnake	1959	5	3	2	1
	1960	5	4	1	3
	1961	5	3	2	1
	1959-61 ave.	5	3.3	5	4
	1962	10	6	2	4
	1963	10	7	4	2
	1964	10	2	2	0
	1965	10	3	0	3
	1962-65 ave.	10	4.5	8	9

Table 33. Location of kill - game checked east of Lincoln - 1965

Area	Elk	Mule Deer	W.T. Deer
Area 281			
Alice Creek	18	31	1
Copper Creek	11	11	2
Keep Cool Creek	2	5	2
Beaver Creek	2	3	3
Stonewall Creek	2	1	2
Landers Fork	9	6	2
Bartlett Creek	1		
Cadotte Creek	1	4	
Lincoln Gulch	1	1	1
Silver King Mtn.	0	2	1
Liverpool Creek	0	2	
Arastra Creek	0	1	2
Markham Mtn.	0	1	
Lincoln Canyon	0	0	7
	47	68	23
Area 280			
Baking Powder	0	2	0
Meadow Creek	0	1	0
Bugle Mtn.	2	0	0
	2	3	0
Area 28			
Clearwater River	9	2	6
Monture Creek	3	1	0
Ovando Mtn.	2	2	0
	14	5	6
Area 29			
Dalton Mtn.	2	2	4
Seven Up Gulch	2	3	
Wales Creek	1	0	1
Humbug Creek	1	4	1
Nevada Creek		1	
Buffalo Gulch		1	
Stemple Pass		4	
Field Gulch		1	
Black Diamond		5	1
Your Name Creek		2	
Hoodoo Mtn.			1
Sauerkraut Creek			2
Hogum Creek			1
	6	23	11

JOB COMPLETION REPORT
INVESTIGATIONS PROJECT

State of Montana Name Wildlife Investigations, District Two

Project No. W-72-R-10 Title Big Game Surveys and Investigations -

Job No. A-2 Deerlodge Unit Re-check

Period Covered July 1, 1964 - June 30, 1965

ABSTRACT:

Livestock use on areas also used by big game in the winter continues to be heavy (mostly privately owned lands). Approximately 11,000 acres of land has been logged the past ten years in the Deerlodge Unit. Near 17 percent of this logging occurred in the winter range zone where it was most beneficial to big game. Mining and smelting have been active in the unit and adverse effects on animals were noted in the Garrison area due to chemical residues in the smoke. Recreational use of Forest Service lands is increasing. Big game hunting license sales are lower in the unit. The winter of 1964-65 was the most severe for big game the past five years.

Game population trends are believed to vary in different hunting units. Overall it is believed that big game numbers are near the same as in 1961 in the Deerlodge Unit. Production of elk, white-tailed deer, moose, mountain sheep and mountain goats is indicated to be good in the Deerlodge Unit. Production of mule deer is suggested to be fair, relative to other herds. Twenty four percent of 270 ear-tagged elk released in the Unit in the past 15 years have been reported shot. Kill and sightings of these marked elk suggests considerable drift from the release sites by these Yellowstone elk.

Grassland range conditions were found to be generally slightly improved. However, utilization at some sites has been greater than desirable. Browse condition rates very poor in the unit with a downward trend the past several years. On National Forest lands in the Deerlodge Unit cattle grazing increased 3 percent and sheep grazing decreased 69 percent (about 1,700 sheep were replaced by 210 cattle). The Forest Service has built a fair amount of fence on their grazing allotments the past several years in an effort to improve range conditions by a rest-rotation grazing system for cattle.

The deer harvest has been down the past four-year period from past average in all hunting units. The elk harvest has been higher in areas 210 and 214 but lower in areas 211, 212, 213, and 215 the past four years than a prior period. The deer harvest was lower in 1964 than any of the past four years. The elk harvest was highest in 1961 and lowest in 1962 of the past four years. Population trend, range status, and hunter success suggest that special permit numbers for moose, goat, and sheep have been near the allowable harvest to maintain these populations in good condition. The proportion of mule deer to white-tailed deer harvested has increased in the Deerlodge Unit. A higher proportion of bucks and bulls have been taken the past four years. Hunting pressure has tended to be lighter with less hunters in 1964 than other years since 1960. Non-resident hunters have remained near stationary. Under 50 bear are harvested each year in the unit.

It is recommended that seasons on elk and/or deer re-open if present regular seasons do not result in more adequate harvests in areas with range overuse. It is recommended that the possibilities for acquisition of key big game winter ranges now in private ownership be further investigated.

OBJECTIVES:

To determine the status and trend of big game populations, harvest, production, herd composition, and forage conditions in the unit in a more intensive manner than can be accomplished during the District-wide surveys.

PROCEDURE:

1. Detailed big game winter range maps were prepared by reference to former work and aerial photos. Current information was obtained by aerial and ground surveys.

2. New permanent range survey and pellet count sample plots were established on key areas not previously sampled, and studies on established plots were continued.

3. Sex and age composition counts of important herd units were obtained by sample counts from helicopter or ground.

4. Harvest trends and biological data were determined by checking stations, roving patrols, and the statewide questionnaire.

5. Losses on important wintering areas were determined by spring field reconnaissance.

6. Livestock use and competition with game on important winter game ranges were determined.

7. When possible, big game range surveys were made in cooperation with the Forest Service, Bureau of Land Management, or other land management agencies concerned.

8. A report summarizing trend data and containing recommendations for management based on current information was prepared.

HABITAT AND LAND USE TRENDS

HISTORY:

The areas was settled in the late 1850's when gold was discovered in Gold Creek. Mining was active in the area until recent years. Numerous "wagon roads" that led to the old mining camps still persist, which have provided considerable access for hunters.

The early day smelter built at Anaconda deposited waste products in the smoke that killed vegetation for a fair distance. Vast quantities of timber were clear-cut for fuel at the smelter from 1870 until about 1930.

Thus, the area around Anaconda was somewhat denuded in the early days. The timber and ground vegetation has been slow to come back in some areas.

With the abandonment of most of the mines, agriculture has become the leading industry in the area. Most of this agriculture is in the form of relatively large stock ranches.

There has been no significant trend in land use in recent years. Lands have tended to become more valuable, which has perhaps caused more intensive land use practices in some instances.

TREND IN CLIMATE:

The climate in the area is characterized by summers with warm days and cool nights, and relatively long cold winters. Most of the unit is situated above 4000 feet elevation.

Winter conditions for game tend to be relative for each area. In arriving at some standard for rating a winter for game survival, the average temperature and cumulative precipitation during the period November through March at a representative weather station have been considered. Such information for Philipsburg, which is judged to be representative for the unit, is given below for the past ten years:

Winter	Precipitation	Temperature	Rating for Game*
1955-56	5.13	22.3	Severe
1956-57	1.87	25.6	Normal
1957-58	2.74	28.0	Mild
1958-59	3.64	28.2	Mild
1959-60	2.27	25.3	Normal
1960-61	2.60	30.1	Mild
1961-62	3.18	24.2	Normal
1962-63	3.92	28.9	Mild
1963-64	3.26	27.0	Mild
1964-65	5.35	26.3	Severe
20 year Average	3.96	26.66	

*Severe - Above average precipitation and below average temperature
Normal - Above average precipitation or below average temperature
Mild - Below average precipitation and above average temperature

Only two winters rating severe have occurred in the past ten years in the unit. The winter of 1964-65 was mild until mid-December when heavy snow and extremely cold temperatures occurred. The weather moderated considerably in January and many south and west exposed slopes in the lower winter range zone became snow-free. February and March had only brief periods of snow and cold temperatures.

TREND IN VEGETATION:

The unit is approximately 30 percent grassland, 55 percent forest, 10 percent subalpine-barren, and only 5 percent cultivated. The western sub-units (210 and 211) have considerably more forested area, and inversely

the eastern sub-unit (215) has the highest proportion of grassland.

There appears to be a trend toward conifers invading grasslands in recent years. The extent of this is not known. It is probable that logging is opening up at least an equal area. However, only limited clear-cut logging is being done on the winter ranges.

TREND IN LAND OWNERSHIP:

The unit is near 55 percent public land and 45 percent privately owned land. Ranches have changed ownership and some exchange of lands between the Forest Service and private owners has occurred. The Anaconda Company, formerly the largest private land owner, recently sold a large parcel of land in the Anaconda area to a ranch corporation. These changes in ownership could have an adverse effect on big game depending on the attitude of the new owners toward game and the degree the land is grazed.

TREND IN ECONOMY:

Agriculture is the largest and most stable industry in the Unit. This is mostly in the form of large beef cattle ranches. There appears to have been no major changes in agricultural practices that might influence big game in the unit in recent years.

The timber industry is growing in the Unit. Mills at Hall, Anaconda, Deer Lodge, and Garrison are in operation. The increased rate of timber harvest should be favorable for big game by creation of openings, especially if the cutting occurs in the big game winter range zone. Approximately 10,800 acres of Forest Service timber land were clear-cut or heavy selectively cut in the period 1955 to 1965 in the Deer Lodge unit. Nearly 200 miles of access roads were constructed for logging. Roughly 17 percent of this timber harvest occurred in the winter range zone.

Mining is an important industry in the Deer Lodge unit. The Anaconda Smelter continues to operate and phosphate mining has been active. Prospecting has resulted in some road building and renovation of other old roads. A large phosphate processing plant has been built in lower Douglas Creek and a chemical plant has been built at Garrison. Chemicals in the smoke released from the Garrison plant are believed to have had an adverse effect on the health of animal and plant life in the area.

TREND IN RECREATION:

The Deer Lodge unit is used extensively for recreation by people residing in towns in or surrounding the area. Camp groud facilities have been expanded in recent years on Forest Service lands. The trend in recreational use is reported to be increasing on Forest lands.

Big game license sales in the Deerlodge unit are as follows:

Year	Resident Big Game Licenses Sold*	$100 Non-resident Licenses Sold*
1945	2,722	68
1955	5,280	87
1956	5,419	104
1957	5,322	101
1958	5,118	114
1959	4,829	103
1960	4,790	85
1961	4,627	102
1962	4,481	111
1963	4,467	142

*Based on sales in Granite, Powell and Deer Lodge counties

Resident big game license sales in the counties within the unit have declined since 1956. Non-resident big game license sales hit a high in 1963.

Four licensed outfitters operated in the unit in 1964. There appears to be a potential for more outfitters to operate.

GAME RESOURCE TRENDS

HISTORY:

Explorers and early miners reported an abundance of deer and elk in the Deerlodge area about 1860. Mountain sheep were reported to have been common in the Rock Creek area in 1890-95 when homesteaders moved into that area. Long-time residents recall that all game became scarce about 1910. Deer became more numerous and by about 1935 probably reached a peak number. Elk increased gradually and had become common by about 1945 over most of the unit. Instances where elk were over-utilizing their winter ranges came to the Department's attention in about 1950.

RECENT POPULATION TRENDS:

Past investigations have been sporadic and limited in scope. Records of population size are meager. Thus, it is not possible to determine precise trends in the big game population in the unit.

Some basis for future reference and long-term trends may be provided by game observations made during past studies in the Unit. Numbers of big game seen along similar travel routes in 1956-57, 1960-61 and 1964-65 are as follows:

Area	Type Travel	Date	Distance	Mule Deer	Elk
Foster-Lost Cr.	Horseback	7/56	12	1	111
	"	7/60	12	1	3
	"	7/64	12	0	5
Dry Cottonwood	Jeep	2/56	5	65	8
	Horseback	2/61	5	7	0
	Jeep	2/65	5	16	2
Porters Corner to Wyman Ranch	Auto	3/56	27	162	5
	"	3/61	27	73	0
	"	3/65	27	53	0
West Fork Buttes	Horseback	3/56	7	60	0
	"	3/61	7	47	9
	Jeep	3/65	7	23	14
Total observed		1956-57	28	288	124
" "		1960-61		128	12
		1964-65		92	21

Attempts to count elk in the open foothill areas have been made most winters since 1953 in portions of the Deerlodge Unit. Experience has shown that optimum counts are made during the period of one hour after daybreak or one hour before dark. This limitation is frequently further restricted by weather, availability of suitable aircraft, or conflicting activities of personnel. Thus, complete and adequate counts have not been possible each year. Windy weather in upper Rock Creek and the Flint Range nullified several attempts to count elk in these areas in 1965. Aerial elk observations made are given in Table 1.

More elk were observed in areas 210 and 211 than in the past. Less elk were observed in areas 212, 213, and 215 than some recent years in the past.

Based on the observations of animals, sign and range the recent trend in elk and deer is believed to be as follows:

Area	Deer Numbers	Elk Numbers
210	Decreasing past four years	Increasing past four years
211	Increasing past four years	Increasing past four years
212	Stationary past four years	Stationary past four years
213	Increasing past four years	Decreasing past four years
214	Stationary past four years	Stationary past four years
215	Increasing past four years	Stationary past four years

The mountain sheep population in the Rock Creek area appears to be about static the past four years. Recent counts are as follows:

	1956	1961	1965
Ground counts	51	130	103
Aerial counts		56	78

Mountain goat numbers are believed to be slightly less at present than four years ago based on lower hunter success. Four days were spent in the Pintlar area in August 1964 and fifteen goats were observed.

Moose numbers are believed to be near the same the past four years in the unit based on incidental observation, browse use, and hunter success.

HERD COMPOSITION AND PRODUCTIVITY:

Sex and age of mule deer observed and dead mule deer checked during the fall hunt are given below:

	Winter Field Checks		Fall Harvest Check
Year	Fawns per 100 does*	Fawns per 100 adults	Fawns per 100 does
1957-61 Ave.	72	44	39
1962	47	45	35
1963	69	58	
1964	65	49	13
1965	69	41	
1962-65 Ave.	63	48	

*Partially adjusted ratio from adult:fawn ratio assuming 50% bucks

The doe-fawn ratio suggests fair reproduction and/or fawn survival in the mule deer herds in the Deerlodge Unit.

The proportion of fawns in the fall hunter harvest is believed to be biased due to hunter preference for mature deer.

Only 47 white-tailed deer were observed and a ratio of 68 fawns per 100 adults noted.

Sex and age of elk observed in the field and checked during the fall hunt is given below:

Year	Winter Field check Calves per 100 cows	Hunter Harvest Calves per 100 cows
1957-61 Ave.	50	46
1962	54	32
1963	59	57
1964	--	28
1965	41	
1962-65 Ave.	51	39

Production and/or survival of elk appears to be good in the Deerlodge Unit. Lower production in 1964 is suggested.

Only 12 mountain goats were classified, with a ratio of 34 kids per 100 adults.

A ratio of 35 lambs per 100 ewes was observed in the bighorn sheep herd on Rock Creek. This suggests that the Rock Creek herd rates fair production-wise with other bighorn herds in the western states.

Sixteen moose were classified -- 5 bulls, 6 cows, 5 calves -- suggesting a ratio of 83 calves per 100 cows. This would suggest excellent production relative to other moose herds.

DISTRIBUTION:

Elk, mule deer and moose are present over nearly the whole Deerlodge Unit. White-tailed deer are present in the lower drainages of the unit. Mountain sheep are restricted to a portion of the Upper Rock Creek area. Mountain goats occur in the Pintlar area, the Flint Range, and along the divide between the Bitterroot River and Rock Creek.

MOVEMENTS AND MIGRATIONS:

Positive information regarding movements and migrations of big game in the Deerlodge Unit is limited. Some tagged elk (from Yellowstone Park) have been released in the unit. A summary of tag returns is given below:

Release Site Date of Release Number of Elk	General Area where reported killed	Number reported killed to date
Rock Creek at mouth of Cougar Creek March 1952 45 elk	Cougar Creek	2
	West Fork Rock Creek	4
	Trout Creek	1
	Upper Willow Creek	1
	Burnt Fork Bitterroot	3
	Madison River	1
	Beaverhead Area 32	3
		17
Mill Creek February 1952 34 elk	Beaverhead area 32	3
		3
Gold Creek January 1951 20 elk	Flint Range Area 212	3
		3
Peterson Creek December 1950 20 elk	Dog Creek Area 215	1
	Boulder River Area 318	1
		2

Release Site Date of Release Number of Elk	General Area where reported killed	Number reported killed to date
Olson Gulch 1959-60-62-64 142 elk	S. Flint Range Area 213	13
	Flint Range Area 212	8
	Beaverhead Area 32	8
	Nelson-Storm Lake Area 214	4
	Beaverhead Area 319	1
		34
State Prison Ranch February 1963 29 elk	No. Flint Range Area 212	9

Two tagged Yellowstone elk released near Walkerville in Area 318 were reported shot in Area 215. Several elk with pink neckbands (Walkerville release) were observed in Dry Cottonwood Creek of Area 215.

A majority of the transplanted elk have been shot in the area where they had been released. However, considerable drift of these elk to other hunting units did occur.

The 33 elk released on Olson Gulch in February 1964 had red neck-bands for easier identification. A summary of sightings of these elk is given below:

Date	Number	Area
April 1964	8	North of Lost Creek
May 1964	1	Seymour Creek
July 1964	3	Head of Foster Creek
August 1964	6	Ten Mile Creek - Beaverhead
September 1964	9	Trout Creek
March 1965	3	Olson Gulch
March 1965	2	Racetrack Creek

Sightings of these marked elk suggest a drift of up to 20 miles in several directions from the release site.

More positive elk movement information is needed in the Deerlodge Unit.

POPULATION LOSSES OTHER THAN HUNTING:

There are constant losses to animal populations due to old age, starvation, disease, accidents, predators, and poaching. Generally such losses are lower in population that are properly harvested by legal hunting.

Eleven deer carcasses were found the spring of 1965 in area 210. Three of these were fawns that showed evidence of malnutrition. Five were "old" animals with poor dentition. No dead deer were found the spring of 1960-61 following a mild winter.

The extent of losses due to disease is not well known. Most animals

checked in the fall appear to be in prime condition. Blood samples from elk and deer in the Deerlodge Unit checked negative for the common livestock diseases.

Coyotes and bears are controlled at the request of livestock ranchers over most of the unit. Predator numbers appear to be stable at a relatively low level.

BIG GAME FORAGE TRENDS

HISTORY:

The grasslands of the Unit generally have been damaged by overuse during the past 100 years. Large numbers of sheep, cattle, horses, elk and deer have at various times damaged at least portions of the range by overuse. Ploughing of range lands and chemical damage from the smelter have hurt some areas.

Approximately two-thirds of the winter range are privately owned lands. Over 80 percent of the winter range is privately owned in areas 213 and 215. The proportion of private lands used as big game winter range is higher in the Deerlodge Unit than other management units in District Two.

The primary vegetative type used by elk and deer in the winter is grassland. Most of the key winter ranges are south or west exposures where sun and wind action tend to reduce snow depth.

TREND IN RANGE CONDITION:

Range condition surveys have been limited in the past. Transects to determine condition and trend have been established during the past ten years mostly.

Twelve sites in the Flint Range were surveyed for range status in 1957 and rechecked in 1960 and 1964. Findings at these grassland sites are given on the following page.

	1960			1964			
	% HC or CE	Density (Inches)	Leaf Ht.	% HC or CE	Density (Inches)	Leaf Ht.	Trend in Condition
East BLM							
Ag sp	58	10.8	9.0	28	16.8	8.9	down
Fe sc	56	3.7	9.6	14	3.0	14.5	up
Stucky Ridge							
Ag sp	88	22.8	9.9	12	7.4	14.8	up
Fe id	54	2.5	5	16	5.1	5.4	up
Powell Ridge							
Ag sp	92	10.4	8.4	36	9.6	11.5	up
Modesty Ridge							
Fe sc	26	3.9	8.2	38	4.84	12.37	
Racetrack Ridge							
Ag sp	24	8.1	11.6	4	6.1	15.9	up
Fe id				8	7.2	6.0	
Dempsey Ridge							
Ag spic	18	19.1	7.1	36	13.8	8.0	
Fe id				36	4.2	2.6	
Elk Ridge							
Fe sc	68	7.1	8.8	78	9.5	9.2	down
Dingwall Ridge							
Fe sc	76	4.3	9.4	38	14.1	12.5	up
Ag sp				0	7.0	14.5	up
Douglas Mtn.							
Ag sp	68	7.7	11.2	34	6.9	14.0	up
Fe sc				18	15.3	11.2	
		1963			1964		
Robinson Ridge							
Fe sc	72	4.68	9.24	73	6.56	9.1	
South America Park							
Fe sc	87	9.12	7.08	85	9.07	6.23	
Ridge between Robinson & Elk							
Fe id	54	6.96	4.80	54	9.2	4.10	

The trend in range condition varied between sites. Significant improvement was noted on the Douglas Mountain, Dingwall Pasture, Racetrack ridge, Powell ridge, Stucky Ridge, and East BLM sites. Other sites showed only slight improvement. At the East BLM site a trend toward improvement in rough fescue and a decline in the density of blue-bunch wheat grass was noted as an indication that rough fescue was a climax grass at this site and was

replacing the blue-bunch wheatgrass.

Range conditions have improved very little on the Prison Ranch foothill areas. They are developing tame pastures which should provide grazing relief to the foothill range when they are ready to carry part of the cattle.

A half acre game-livestock exclosure was built on Modesty Ridge in 1960 by cooperative effort of the Anaconda Company and the Montana Fish and Game Department. Line intercept range condition transects were established inside the exclosure and just outside in the grazed area. These transects were rechecked in 1964. Results were as follows:

	Inside Exclosure			Outside Exclosure		
	1960 Hits	1964 Hits	Change %	1960 Hits	1964 Hits	Change %
Fe. sc.	21	41	+49	17	41	+59
Fe. id.	3	7	+57	3	12	+75
Fe. spp.	0	2	+200	0	3	+300
Ag. Sp.	5	12	+58	9	15	+40
Ko. Cr.	5	8	+37	0	6	+600
Poa Spp.	1	4	+300	5	3	-40
Carex	36	29	-19	19	15	-21
Total grass-sedge	71	103	+31	53	95	+44
Artemesia frigida	15	12	-20	29	18	-38
Astragulus	3	8	+62	8	10	+20
Achillea	2	1	-50	1	2	+100
Antenaria	0	0		3	1	-66
Erigeron	0	1	+100	4	2	-50
Erogonum	0	3	+300	1	3	+67
Unknown forb	0	4	+400	1	0	-100
Total forbs	20	29	+31	47	36	-23
Litter-moss	93	55	-42	96	62	-35
Rock	1	1	0	0	1	+100
Bare soil	15	12	-20	4	6	+33
Total non-veg.	109	68	-37	100	69	-31

The results indicate an increase of grass and forbs in the non-grazed area. Grass density was greater outside the exclosure but forb density decreased. A possible factor in this trend is that sheep use outside the exclosure may have favored grass by preference for forbs.

Based on U. S. Forest Service, Region 1, Scorecard for Vegetative Condition of Mountain Grasslands, this site would rate good for density and composition of desirable plants. Observations have indicated relatively light use by both livestock and game at this site in recent years which may in part account for the improvement.

Grass utilization plots have been established at eighteen sites in the unit by the Forest Service and the Fish and Game Department the past few years. A summary of results is given in Table 2.

Of four sites checked in area 210, one had received more than proper use by elk during the winter of 1964-65.

The one site checked in area 211 had received more than proper use by elk the past winter.

Of the seven sites checked in area 212 five received more than proper use by game and livestock. Fall checks on the Prison ranch indicated livestock use was quite heavy at three of these sites in 1964.

The one site checked in area 213 received less than proper use by elk the past winter.

All of the four sites checked in area 215 received more than proper use by elk the winter of 1964-65.

A ratio of 667 elk pellet groups per 100 deer pellet groups was noted at these grassland check sites in 1964 and 1965.

Most of the range condition plots on Forest Service lands in the Bonita District were rechecked in 1963 or 1964. These were "Parker" method transects rating vegetative composition, density, and vigor. A summary of results for plots receiving game and livestock use is given in Table 3.

Of the ten sites checked seven were believed to be improving and three were static.

Palatable browse has been checked at key sites since 1956. Results since 1960 is given in Table 4.

Palatable browse has remained in a very poor or poor condition in all hunting units except area 210. The browse in area 210 has changed from very poor to fair condition from 1960 to 1965.

Utilization of browse at the sites checked was greater during the 1963-64 winter than any other winter the past five years.

The number of deer pellet groups per acre on browse check plots was higher in 1965 than any year since 1960. A ratio of 11 elk per 100 deer pellet groups existed at these browse transects the past six years.

Pyramidal shaped agronomy cages were built from 1960 to 1965 to provide an exclosed sample of range on winter game use areas. Most cages were roughly 16 by 16 feet at the base. The location of agronomy cages and observations is given below:

Location	Observations
Area 210 Spring Creek Ridge	Constructed the fall of 1960. By the spring of 1965 the chokecherry and grass plants were taller and more vigorous inside than those outside; suggesting that grazing was retarding improvement at this site.

Location	Observations
Spring Creek Bald Hill	Constructed the fall of 1960. Vigor and density of rough fescue plants was better inside by the spring of 1963. Seedling chokecherry plants not bigger inside than out; suggesting that grass may be climax vegetation at site.
Kitchen Creek Bald Hill	Constructed fall of 1960. Little difference in vegetation inside. Area has had non-use by livestock for five years. Game use has been moderate.
Kitchen Creek Ridge	Constructed fall of 1960. Little difference in vegetation inside. Site has probably received light game use and non-use by livestock.
East Hill-Upper Spring Creek	Constructed summer of 1964. Observation in May 1965 showed considerably more grass remaining inside than out. It was concluded that near 50 percent of the forage had been taken by elk and deer during the winter.
Golden Mountain	Constructed in 1961. Slightly better ground cover inside. Recovery very slow at this site. Much pocket gopher damage both inside and out.
East Fork Brewster Bald Hill	Constructed in 1961. Observation fall 1964 showed cattle had taken considerable forage outside. Better forage density inside. Light game use.
North Fork Brewster Ridge	Constructed in 1961. Observations spring of 1965 showed slightly better density and vigor inside. Periodic observations suggest moderate use by both livestock and game at site.
Strawberry Mountain	Constructed in 1961. Density and vigor of palatable grass better inside than out by fall of 1964. Area used heavy in late spring by game and early summer by livestock.
Hogback Ridge	Constructed summer 1964. Considerable use by elk suggested by spring of 1965.
Sheep-Windlass Ridge (Three cages)	Constructed summer 1960. Periodic inspections have shown recovery of sites. Slightly better density and vigor of desirable grass inside. Young conifers vigorous both in and out; suggesting game use on conifers not excessive past few years.

Location	Observations
Mill Gulch (Two cages)	Constructed summer 1960. Periodic observations have shown more improvement in density and vigor of desirable grasses inside cage than outside.
Area 212	
South Douglas Ridge	Constructed summer 1960. Forage production was checked at this site in late June 1965. There was 28 percent more forage per unit area inside the cage as there was outside. There had been non-use by livestock in 1965.
Boulder Creek	Constructed summer 1960. Mountain mahogany and chokecherry plants inside gradually becoming more vigorous. Mountain mahogany and chokecherry plants outside all severely hedged and decadent.
Area 213	
Olson Gulch	Constructed summer 1960. Slight improvement noted in browse and grass protected as compared to outside.
Tin Can Gulch	Constructed summer 1960. Cage was tipped over in 1962. Browse plants protected show better form class than those outside--not protected.
Area 215	
Dry Cottonwood Creek	Constructed summer 1960. Bitterbrush and serviceberry protected has become more vigorous. These species outside have remained in severely hedged condition.

LAND USE PROBLEMS:

Competition between big game and livestock occurs on some areas. Most of these conflict areas are big game winter ranges which are also used by livestock.

Approximately 65 percent of the elk and deer winter on privately owned lands. Consequently, the number of elk and deer that can be maintained in the Deerlodge Unit depends, to a high degree, on how much game use the private land owners will tolerate and how heavily they graze these lands with livestock. Most such lands are grazed fully before the cows are taken off in the fall.

Complaints of big game damage on private lands have been received from some sub-units during the past four year period. Recent landowner complaints of game damage are as follows:

Hunting Unit Location	Year	Species	Nature of Damage
Area 210			
Upper Rock Creek	1957-65	Elk	Haystacks eaten, trampled and stack fences torn down
Mouth Harvey Creek	1964	Elk	Haystacks eaten and trampled
Area 214			
Trout Creek	1961-65	Elk	Haystacks eaten and trampled
Area 215			
Lower Little Blackfoot	1964	Mule deer	Haystacks eaten and trampled

There have been fewer complaints the past four year than there were the prior four year period.

Livestock use on National Forest lands in the Deerlodge Unit, 1956, 1960 and 1964 is given below:

	1956		1960		1964	
Area	Cow Months	Sheep Months	Cow Months	Sheep Months	Cow Months	Sheep Months
Rock Creek, W. Flint Creek	10,615	0	10,482	0	10,482	0
Flint Range	4,380	2,450	4,380	2,670	4,548	0
E. Deerlodge, L. Blackfoot	5,266	6,840	5,084	6,180	5,520	2,700
Deerlodge Unit	20,261	9,290	19,946	8,850	20,550	2,700

Several exchanges of sheep for cattle on the Forest range were made, resulting in an increase of 3 percent in cattle use and a decrease of 69 percent in sheep use since 1960. Many allotments have been cross fenced to make rest-rotation grazing possible. Key game winter range sites have been fenced off and the forage reserved for game in some areas. Some cattle have been moved to new ranges created following clear-cuts and reseeding.

ADJUSTMENTS IN LAND USE:

It appears that generally the timber harvest has been and will continue to be beneficial to big game. The temporary openings created should provide added forage for both game and livestock. Where clear cuts are made on south and west slopes in the game winter range zone it would seem wise not to plant conifers to prolong the period of greater ground forage density.

The available forage supply in the winter range zone is the primary key to the number of big game animals it is possible to carry in an area. On many of these winter range areas, the combined use of big game and livestock is too great and, as a result, at least portions are in poor condition. A possible adjustment that would favor big game in such areas

would be reservation of forage for game use in the winter and spring. Where these key lands are privately owned, it would seem wise to investigate the possibility of acquisition of grazing rights by land purchase or lease. Where such lands are in public ownership, the administering agency should be requested to reserve the forage for game use, if possible.

Game range aquisition and maintenance will logically be costly and have to be limited in extent.

The Forest Service have on most districts prepared a Wildlife Habitat Management Plan. These plans express the policy of managing lands best suited for wildlife in the best interest of wildlife. This should result in gradual land use adjustments that should favor big game.

There appears to be no easy solution to the range problem. Taking more livestock off the Forest ranges could cause greater use on private lands at lower elevations which are even more important to game. There are also ranchers who state that as long as they can use public lands for livestock they will tolerate moderate game use on their lands.

Another complicating factor in the management of the Forest ranges is that some unfenced private and leased lands are pooled for grazing. If the permittees who own or lease such lands believe they are not being allowed to graze the range adequately they could fence these lands. Under fenced pasture conditions they could accomplish complete forage use by livestock, leaving virtually nothing for game. Thus, there appears to be no universal or easy solution to the range problems in the Deerlodge Unit.

GAME MANAGEMENT

HISTORY:

Hunting regulations were put into effect in 1872 and were gradually made less liberal until the season on elk was closed in 1913 and a one buck limit was put into effect on deer in 1921. Buck deer seasons and bull elk seasons in portions of the unit only prevailed until 1952 when a portion was opened to either sex deer. Seasons generally became more liberal during the 1950's with more either sex elk seasons and portions open to the taking of two deer of either sex.

TREND IN HUNTING REGULATIONS:

Summaries of recent elk and deer regulations are given in Tables 5 and 6. Elk seasons have tended to be slightly less liberal the past four years. 1961 was the last year of two deer bag limit areas in the Deerlodge Unit. Seasons have not been extended past the normal closing dates since 1962.

TREND IN THE ELK AND DEER HARVEST:

Information concerning the big game harvest has been gained by hunter questionnaires, checking stations, and field patrol.

Calculated harvest based on the statewide questionnaire is given in Tables 7 and 8.

These returns indicated:

1. Twenty-four percent less deer and 14 percent less elk were taken the past four years (1961-64) than the four years prior (1957-60) in the unit.

2. Forty eight percent less deer and 18 percent less elk were taken in 1964 than prior average (1957-63) in the unit.

3. Since 1957 when the questionnaire was standardized the highest elk harvest occurred in 1959 and the highest deer harvest occurred in 1957 in the unit.

4. The only hunting unit with a higher elk harvest the past four years (1961-64) than prior average (1957-60) was area 210.

5. The highest number of elk per square mile killed the past four years was .32 in area 214.

6. The highest number of deer per square mile killed the past four years was .68 in area 210.

White-tailed deer occur in significant numbers only in areas 210 and 212. The proportion of white-tailed to mule deer in these areas in recent years is given below:

Area	Year	% White-tailed	% Mule Deer
210	1957-60 Ave.	21	79
	1961	17	83
	1962	18	82
	1963	16	84
	1964	18	82
	1961-64 Ave.	17	83
212			
	1957-60 Ave.	19	81
	1961	18	82
	1962	13	87
	1963	12	88
	1964	20	80
	1961-64 Ave.	16	84

A higher proportion of mule deer have been harvested the past four years in these hunting units.

Sex and age of elk and deer reported harvested by state-wide questionnaire returns are given:

Area / Year	Deer % Antlered	Deer % Antlerless	Elk Bulls:100 cows	Elk Calves:100 cows
210				
1956-60 Ave.	52	48	121	42
1961	64	36	324	82
1962	53	47	---	--
1963	79	21	460	100
1964	63	37	105	23
1961-64 Ave.	65	35	222	51
211				
1956-60 Ave.	51	49	149	38
1961	79	21	100	253
1962	50	50	57	27
1963	54	46	77	--
1964	71	29	129	12
1961-64 Ave.	64	36	91	73
212				
1956-60 Ave.	44	56	86	32
1961	66	34	175	62
1962	54	46	127	132
1963	56	44	128	56
1964	54	46	128	28
1961-64 Ave.	57	43		
213				
1956-60 Ave.	44	56	85	64
1961	84	16	200	0
1962	100	0	---	--
1963	50	50	50	--
1964	52	48	238	--
1961-64 Ave.	72	29	122	--
214				
1956-60 Ave.	56	44	47	58
1961	40	60	0	33
1962	30	70	--	78
1963	61	39	50	50
1964	75	25	135	24
1961-64 Ave.	52	49	46	46
215				
1956-60 Ave.	53	47	76	44
1961	57	43	24	92
1962	73	27	14	78
1963	56	44	613	200
1964	63	37	156	53
1961-64 Ave.	62	38	201	106

Area Year	Deer % Antlered	Deer % Antlerless	Elk Bulls:100 cows	Elk Calves:100 cows
Deerlodge Unit				
1956-60 Ave.	52	48	97	43
1961	65	35	115	77
1962	56	44	35	32
1963	59	41	178	57
1964	63	37	131	28
1961-64 Ave.	61	39	115	49

The proportion of bucks and bulls harvested has been greater the past four years. Perhaps more hunters have been selective toward antlered animals the past few years.

A higher proportion of calf elk were reported shot the past four year period. The kill of calves was reported to be low in 1964.

A checking station was operated on lower Rock Creek weekends and three weekdays during the open season. Three hundred thirty eight hunters, 22 mule deer, 3 white-tailed deer, and 6 elk were checked.

Most of these animals and a few kills checked in the field were aged by dentition. Results are given below:

AGED BY DENTITION, AREA 210, 1964

	½	1½	2½	Prime	Old
Elk					
Bulls	1	2		2	
Cows		1	1	1	
Mule deer					
Bucks	1	5	1	3	1
Does			1	1	
W.T. deer					
Bucks	1	1			
Does	1				

This very limited sample indicates a relatively high proportion of the harvest was young and yearling animals.

TREND IN HUNTING PRESSURE:

The numbers of deer and elk hunters using the Deerlodge Unit, based on the state-wide questionnaire are given below:

Hunting Area - Year	No. deer hunters	No. elk hunters
210		
1957-60 Ave.	959	626
1961	1139	773
1962	1667	731

(Continued)

Hunting Area - Year	No. deer hunters	No. elk hunters
210		
1963	1003	829
1964	711	691
1961-64 Ave.	1130	756
211		
1957-60 Ave.	291	429
1961	237	380
1962	229	330
1963	123	284
1964	115	227
1961-64 Ave.	176	305
212		
1957-60 Ave.	603	844
1961	511	794
1962	575	631
1963	542	717
1964	515	641
1961-64 Ave.	536	696
213		
1957-60 Ave.	322	259
1961	138	92
1962	201	158
1963	152	212
1964	116	158
1961-64 Ave.	152	155
214		
1957-60 Ave.	223	254
1961	184	221
1962	231	272
1963	230	284
1964	143	186
1961-64 Ave.	197	241
215		
1957-60 Ave.	418	840
1961	352	811
1962	481	731
1963	372	859
1964	358	583
1961-64 Ave.	391	746

(Continued)

Hunting Area - Year	No. deer hunters	No. elk hunters
Deerlodge Unit		
1957-60 Ave.	2817	3207
1961	2561	3071
1962	3384	3032
1963	2422	3185
1964	1958	2486
1961-64 Ave.	2581	2944

Hunting pressure is indicated to have been lighter in all hunting units except 210 the past four years. There were less hunters in 1964 than other past recent years in the unit.

The trend in non-residents hunting in the Deerlodge Unit based on questionnaire returns is given below:

Year	% of Total Elk Hunters	% of Total Deer Hunters
1959	4	5
1960	6	8
1961	3	2
1962	6	4
1963	6	4
1964	7	4

The proportion of non-residents hunting in the Deerlodge unit has remained near the same the past few years. The proportion has been slightly higher on years when hunting has been "tough" and probably less residents hunted.

TREND IN MOOSE, GOAT, SHEEP, BEAR AND ANTELOPE HARVEST:

A summary of mountain goat permits issued and harvest is given in Table 9. The number of permits issued has been larger in areas 212 and 214 and less in areas 213 and 222 the past four years compared to 1956 to 1960. Success has been highest in the South Flint Range area but the number of permits has been lower there also. The Pintlar area, 222, has produced the most goats. Slightly more males than females have been killed. The number of applications for goat permits reached a peak in 1963.

A tabulation of location of goat kills is given in Table 10. The Rock Creek - Goat Mountain area has been the kill site of most of the goats reported taken in area 212.

The Barker - Nelson drainages have been the site of kill of most of the goats taken in area 214.

The goat kill has been more widely distributed in the Pintlar area. Approximately 80 percent of the goats have been reported killed in the District 2 portion of the hunting unit.

A summary of moose permits issued and harvest is given in Table 11. The number of permits issued for moose has been larger the past four years than the four year period prior. Success has remained above 70 percent the past several years in all areas. The number of applications for permits was larger in 1964 than the past few years. Slightly over half the moose harvested (54%) have been males. Twelve percent of the moose killed have been calves.

A summary of reported location of moose kills is given in Table 12. Most of the moose killed in area 212 have been taken in the portion from Gold Creek south to Tin Cup Joe Creek.

Mill Creek has been the kill site of most of the moose killed in area 214.

Most of the moose taken in the West Flint Creek area (216) have been taken in Upper Willow drainage.

The Middle Fork of Rock Creek has been the kill site of the largest proportion of the moose killed in area 217.

The Ross Fork - Medicine Lake area has yielded more moose than other portions of area 218.

Most of the moose taken in area 219 were reported shot along the main Rock Creek bottoms.

A summary of bighorn sheep permits and kill is shown below:

Year	No. permits	Sex	Sheep killed	Sex killed	
				Rams	Ewes
1954	5	3/4 curl rams	5	5	0
1955	5	3/4 curl rams	2	2	0
1956	0				
1957	0				
1958	5	3/4 curl rams	4	4	0
1959	0				
1960	4	3/4 curl rams	4	4	0
1961	10	adults	10	8	2
1962	25	adults	19	17	2
1963	10	adults	10	6	1
1964	5	3/4 curl rams	3	3	0

Success has been good on the sheep permits issued. Either-sex permits were discontinued as hunters were taking sub-trophy age rams rather than ewes (86% rams on either-sex years). It is planned to trap and relocate surplus ewes if possible.

A summary of antelope permits and harvest is shown on the following page.

Year	No. permits	Sex	Number killed
1957	25	bucks	10
1958	25	either	11
1959	25	either	14
1960	40	either	27
1961	20	either	10
1962	20	either	8
1963	15	bucks	9
1964	0		0

The small antelope population near Deerlodge has provided limited antelope hunting. No permits were issued in 1964 as less antelope than normal had been seen.

A summary of black bear harvest in the Deerlodge unit based on questionnaire returns is given below:

	Bear hunters	Bears killed
1960	1002	28
1961	731	22
1962	770	0
1963	799	46
1964	267	45

This source of harvest information suggests more black bear harvested the past two years in the unit.

RECOMMENDATIONS:

1. It is recommended that elk and deer seasons not be made less liberal in the unit. If adequate harvests are not made during the regular season period it is recommended that seasons be reopened in areas with more than proper range utilization and/or damage complaints during the winter of 1964-65.

2. It is recommended that special permits for moose, mountain goat, and mountain sheep be continued at near the same number as in 1964.

3. It is recommended that browse transects, grass utilization and condition transects, and agronomy cages be checked each year to determine the trend in range utilization and condition.

4. It is recommended that composition of the elk and deer herds be checked annually to determine productivity of the big game herds.

5. It is recommended that the U. S. Forest Service and the Bureau of Land Management be requested to reserve more forage on key game winter ranges if possible and practical.

6. It is recommended that the possibilities for acquiring certain important game winter range areas in upper Rock Creek that are now in private ownership be further investigated and these range lands be acquired when possible.

Prepared by: Fred Hartkorn

Approved by: Wynn G. Freeman

Date: June 30, 1965

Table 1: Elk observed by aerial reconnaissance, Deerlodge Unit, 1953 through 1965*

Area	Ave. 1953-55	Ave. 1956-58	Ave. 1959-61	1962	1963	1964	1965
Boulder Creek-Dunkleberg Creek	96	106	64	137	58	151	89
Dunkleberg to Rock Creek	21	56	62	26	60	12	19
Rock Creek to Powell Creek	121	176	101	99	46	44	93
Powell Creek to Racetrack Creek	34	89	93	108	69	137	96
Racetrack Creek to Lost Creek	167	75	96	105	106	92	4
Lost Creek to Warm Springs Creek	120	74	53	51	32	0	41
Warm Springs Creek to Fred Burr	27	26	7	13	28	17	19
Fred Burr to Boulder Creek	50	51	18	22	41	0	31
Total Flint Range	621	645	486	516	440	453	392
Total Area 212	349	496	337	360	302	361	347
Total Area 213	287	149	149	156	138	92	45
Mill Creek - Barker	164	80		91			
Barker - Georgetown				0			
Georgetown - E. Fork		32	33	54			27
Total Area 214	164	56	42	145			
Girard to Dry Cottonwood			30	37	43	35	26
Dry Cottonwood - Peterson			141	101	74	115	68
Peterson-Freezeout			154	93	81	112	96

Table 1. Elk observed by aerial reconnaissance, Deerlodge Unit, 1953 through 1965* (continued)

Area	Ave. 1953-55	Ave. 1956-58	Ave. 1959-61	1962	1963	1964	1965
Freezeout - L. Blackfoot			112	145	157	143	147
L. Blackfoot-McDonald Pass	___	___	17	20	24	0	19
Total Area 215	393	353	490	396	379	405	356
John Long Range		39	79		78		185
West Rock Creek		11	60		33		83
Lone Tree Ridge		25	27				60
Middle Fork-Meadow Cr.		38	35				70

*Best count each year

Table 2. Grass utilization in the Deerlodge Unit

Hunting Unit Site / Year	Species	% of plants grazed	% Utilization	Considered proper use	Pellet groups/acre Elk	Deer
210						
Hogback Ridge						
1964	Fe id & Fe sc	58	36	50	460	20
1965	Fe id	66	43	50	580	0
1965	Ag spic	42	24	50		
Stoney Ridge - S-1 Game only area						
1964	Ag sp	90	73	40	320	120
1965	Ag sp	32	14	40	90	50
S-2 - Ridge						
1964	Ag sp	96	38	50	500	0
1965	Ag sp	92	70	50	486	0
S-3 - steep slope						
1964	Ag sp	100	40	30	290	60
1965	Ag sp	40	18	30	180	140
211						
Ross Fork Ridge						
Lower Park						
1964	Fe sc	100	75	45	780	0
1965	Fe sc	100	75	45	730	0
Upper Park						
1964	Fe sc	100	75	45	340	26
1965						
212						
South Boulder						
1964	Fe sc	64	48	60	140	0
1965	Fe sc	66	50	60	100	0
Fred Burr						
1964	Ag sp	80	34	30	432	0
1965	Ag sp	44	25	30	660	160
Sixmile						
1965	Fe sc	88	67	50	360	20
Racetrack Ridge						
1965	Ag sp	56	42	30	320	0
South America Park						
1963	Fe sc	94	75	30	260	0
1964	Fe sc	96	79	30	460	0
1965	Fe sc	85	65	30	216	0

Table 2. (Continued)

Hunting Unit Site / Year	Species	% of plants grazed	% Utilization	Considered proper use	Pellet groups/acre Elk	Deer
212 (continued)						
Robinson Ridge						
1963	Fe sc	75	55	40	800	0
1964	Fe sc	92	72	40	600	0
1965	Fe sc	88	68	40	330	0
Robinson-Elk Ridge						
1963	Fe id	56	36	40	310	0
1964	Fe id	85	65	40	140	0
1965	Fe id	91	71	40	170	0
213						
Modesty Ridge						
1964	Fe sc	26	18	50	120	20
1965	Fe sc	30	20	50	10	0
215						
Burnt Hollow						
1965		70	58	40	220	0
Sand Hollow						
1965		46	33	30	300	0
Cariboo Mountain						
1965		68	52	45	310	0
Oro Fino Mountain						
1965		64	50	50	280	20
Deerlodge Unit						
1964		82			392	25
1965		66			328	23

Table 3. Range condition and trend based on "Parker" transects on Bonita district

Site	Condition when established			Condition in 1964		Judged
	Date	Soil	Vegetative	Soil	Vegetative	Trend
Spring-Babcock Ridge (Cl #5)	1958	fair	good	fair	good	static
Spring Creek Ridge (Cl #18)	1964	excellent	good			upward
Brewster Creek (Cl #9)	1963	fair	fair			upward
Brewster Creek (Cl #11)	1963	fair	fair			static
Harvey Creek (Cl #2)	1958	fair	good	fair	good	upward
Burnt Basin (Cl #3)	1963	fair	good			upward
Harvey-Eightmile (Cl #C-4)	1958	fair	fair	fair	fair	static
Kitchen Gulch (Cl #15)	1964	good	fair			upward
Kitchen Gulch (Cl #14)	1964	excellent	good			upward
McKnight Ridge (Cl #12)	1964	excellent	good			upward

Table 4. Browse condition and trend in Deer Lodge hunting areas

Area & Year	No. Plots	No. Plants	% Class 3 & 6	Condition Class	% Leader Use	Pellet groups/acre Deer	Elk
210 1960	8	140	62	very poor	22	340	0
1961	9	230	44	very poor	17	150	16
1962	10	230	46	very poor	28	148	2
1963	11	240	44	poor	10	83	13
1964	10	175	32	poor	32	165	12
1965	10	230	22	fair	19	126	3
211-214							
1961	1	25	80	very poor	2	40	0
1962	1	25	80	very poor	67	56	32
1963	1	25	68	very poor	29	80	0
1964	1	25	84	very poor	69	140	18
1965	1	25	64	very poor	43	200	0
212							
1960	3	93	58	very poor	37	107	24
1961	2	45	88	very poor	19	132	0
1962	2	45	67	very poor	52	300	0
1963	2	50	73	very poor	53	187	17
1964	2	50	84	very poor	69	140	18
1965	2	45	85	very poor	53	150	15
213							
1960	5	50	72	very poor	36	103	18
1961	6	64	25	fair	8	170	0
1962	4	55	21	fair	55	41	0
1963	3	75	27	fair	26	84	0
1964	3	55	44	poor	40	43	0
1965	3	75	31	poor	48	160	0
215							
1960	2	45	79	very poor	86	360	0
1961	1	20	70	very poor	28	240	20
1962	3	75	44	very poor	49	390	20
1963	3	75	67	very poor	57	197	2
1964	3	75	79	very poor	73	127	13
1965	4	125	88	very poor	85	395	53
Unit Average							
1960	20	346	64	very poor	34	228	21
1961	20	392	47	very poor	16	146	18
1962	22	475	41	very poor	34	118	11
1963	20	465	57	very poor	35	126	6
1964	19	380	65	very poor	57	123	12
1965	20	500	58	very poor	50	206	14

Table 5. Elk hunting regulations 1961-1964 in the Deerlodge Unit

Area / Year	Dates	Type	Exceptions
210			
1961	Oct. 15 - Dec. 3	1 either sex	Triangle west of Philipsburg closed Nov. 19
1962	Oct. 21 - Dec. 2	1 either sex	
1963	Oct. 20 - Nov. 24	1 either sex	
1964	Oct. 18 - Nov. 22	1 either sex	
211			
1961	Sept. 17 - Nov. 19	1 either sex	Within Forest Boundary
	Oct. 15 - Nov. 19	1 either sex	Outside Forest Boundary
1962	Sept. 16 - Dec. 2	1 either sex	Within Forest Boundary
	Oct. 21 - Dec. 2	1 either sex	Outside Forest Boundary
1963	Sept. 15 - Nov. 24	1 either sex	Within Forest Boundary
	Oct. 20 - Nov. 24	1 either sex	Outside Forest Boundary
1964	Oct. 3 - Nov. 22	1 either sex	Within Forest Boundary
	Oct. 18 - Nov. 22	1 either sex	Outside Forest Boundary
212			
1961	Oct. 15 - Nov. 19	1 either sex	
	Nov. 20 - Jan. 31	1 branch ant. bulls	Flint Creek Drainage portion only
1962	Oct. 21 - Nov. 18	1 either sex	
1963	Oct. 20 - Nov. 10	1 either sex	
1964	Oct. 18 - Nov. 15	1 either sex	
213			
1961	Oct. 15 - Oct. 22	1 either sex	
1962	Oct. 21 - Nov. 25	1 Br. Ant. Bulls	
1963	Oct. 20 - Oct. 22	1 either sex	
	Oct. 23 - Nov. 10	1 Br. Ant. Bulls	
1964	Oct. 18 - Oct. 20	1 either sex	
	Oct. 21 - Nov. 15	1 Br. Ant. Bulls	
214			
1961	Oct. 15 - Nov. 19	1 either sex	
	Nov. 20 - Jan. 31	1 Br. Ant. Bulls	West of Storm Lake Road

Table 5. Elk hunting regulations 1961-64 in the Deerlodge Unit (continued)

Area / Year	Dates	Type	Exceptions
214			
1962	Oct. 21 - Dec. 2	1 either sex	
	Nov. 26 - Jan. 31	1 Br. Ant. Bulls	West of Storm Lake Road
1963	Oct. 20 - Nov. 24	1 either sex	
1964	Oct. 18 - Nov. 22	1 either sex	
215			
1961	Nov. 5 - Nov. 19	1 either sex	
1962	Oct. 21 - Nov. 18	1 either sex	
1963	Oct. 20 - Nov. 10	1 either sex	
1964	Oct. 18 - Nov. 15	1 either sex	

Table 6. Deer hunting regulations 1961-64 in the Deerlodge Unit

Area / Year	Dates	Type	Exceptions
210			
1961	Oct. 15 - Nov. 19	1 either sex	
	Nov. 20 - Dec. 3	2 either sex	Triangle area west of Philipsburg closed Nov. 19
1962	Oct. 21 - Dec. 2	2 either sex	
1963	Oct. 20 - Nov. 24	1 either sex	
1964	Oct. 18 - Nov. 22	1 either sex	
211			
1961	Sept. 17 - Nov. 19	1 either sex	Within Forest Boundary
	Oct. 15 - Nov. 19	1 either sex	Outside Forest Boundary
1962	Sept. 16 - Dec. 2	1 either sex	Within Forest Boundary
	Oct. 21 - Dec. 2	1 either sex	Outside Forest Boundary
1963	Sept. 15 - Nov. 21	1 either sex	Within Forest Boundary
	Oct. 20 - Nov. 24	1 either sex	Outside Forest Boundary
1964	Oct. 18 - Nov. 22	1 either sex	

Table 6: Deer hunting regulations 1961-64 in the Deerlodge Unit (Continued)

Area	Year	Dates	Type	Exceptions
212				
	1961	Oct. 15 - Nov. 19	1 either sex	
		Nov. 20 - Nov. 26	2 either sex	Boulder-Gird Cr. portion
	1962	Oct. 21 - Dec. 2	1 either sex	
	1963	Oct. 20 - Nov. 24	1 either sex	
	1964	Oct. 18 - Nov. 22	1 either sex	
213				
	1961	Oct. 15 - Nov. 19	1 either sex	
	1962	Oct. 21 - Dec. 2	1 either sex	
	1963	Oct. 20 - Nov. 24	1 either sex	
	1964	Oct. 18 - Nov. 22	1 either sex	
214				
	1961	Oct. 15 - Nov. 19	1 either sex	
	1962	Oct. 21 - Dec. 2	1 either sex	
	1963	Oct. 20 - Nov. 24	1 either sex	
	1964	Oct. 18 - Nov. 22	1 either sex	
215				
	1961	Nov. 5 - Nov. 19	1 either sex	
	1962	Oct. 21 - Dec. 2	1 either sex	
	1963	Oct. 20 - Nov. 24	1 either sex	
	1964	Oct. 18 - Nov. 22	1 either sex	

Table 7. Elk harvest from state-wide Questionnaire

Hunting Unit Year	Elk harvested by: Res.	Non-res.	Total	Area (sq.mi.)	Kill per sq.mi.	No. Hunters	% Hunting Success
210							
1957-60 Ave.			92	1060	.08	626	15
1961	184	7	191	1060	.18	773	25
1962	57	0	57	1060	.05	724	8
1963	92	8	100	1095	.09	832	12
1964	125	12	137	1095	.13	691	20
1961-64 Ave.	115	7	122	1095	.11	755	16
211							
1957-60 Ave.			101	245	.41	429	24
1961	61	7	68	245	.28	380	18
1962	86	8	94	245	.38	338	28
1963	46	8	54	245	.22	300	18
1964	35	6	41	245	.17	227	18
1961-64 Ave.	57	7	64	245	.26	311	21
212							
1957-60 Ave.			171	605	.28	844	20
1961	199	7	206	605	.34	794	26
1962	72	8	80	605	.13	647	12
1963	137	16	153	605	.25	734	21
1964	121	6	127	605	.21	641	20
1961-64 Ave.	132	9	141	605	.23	704	20
213							
1957-60 Ave.			38	195	.19	259	15
1961	46	0	46	195	.24	92	50
1962	14	0	14	195	.07	173	8
1963	46	0	46	195	.24	198	23
1964	22	4	26	195	.13	158	17
1961-64 Ave.	32	1	33	195	.17	155	21
214							
1957-60 Ave.			46	165	.28	254	18
1961	61	0	61	165	.37	221	28
1962	57	0	57	165	.39	280	23
1963	46	0	46	165	.28	269	17
1964	43	1	44	165	.27	186	24
1961-64 Ave.	52	0	52	165	.32	239	22
215							
1957-60 Ave.			177	435	.41	840	21
1961	169	13	182	435	.42	811	23
1962	57	8	65	435	.15	747	9
1963	122	16	138	435	.32	832	17
1964	107	4	111	435	.26	583	19
1961-64 Ave.	114	10	124	435	.29	743	17

Table 7: Elk harvest from state-wide Questionnaire (Continued)

Hunting Unit Year	Elk harvested by: Res.	Non-res.	Total	Area (sq.mi.)	Kill per sq. mi.	No. Hunters	% Hunting Success
Deerlodge Unit							
1957-60 Ave.			625	2705	.23	3207	20
1961	720	34	754	2705	.28	3071	25
1962	343	32	375	2705	.14	2912	13
1963	489	48	537	2740	.20	3165	17
1964	453	33	486	2740	.18	2486	20
1961-64 Ave.	501	37	538	2740	.20	2909	18
Rock Creek Area (210 and 211)							
1957-60 Ave.			242	1305	.19	1055	23
1961			259	1305	.20	1153	23
1962			151	1305	.12	1062	14
1963			154	1340	.12	1132	14
1964			178	1340	.13	918	19
1961-64 Ave.			186	1340	.14	1066	17
Flint Range (Areas 212 and 213)							
1954-1956 Ave.			510	800	.64		
1957-60 Ave.			209	800	.26	1103	19
1961			252	800	.32	886	28
1962			94	800	.12	820	12
1963			199	800	.25	932	21
1964			153	800	.19	799	19
1961-64 Ave.			175	800	.22	859	20

Table 8. Deer harvest from state-wide Questionnaire

Hunting Unit Year	Deer harvested by: Res.	Non-res.	Total	Area (sq.mi.)	Kill per sq.mi.	No. Hunters	% Hunting Success
210							
1957-60 Ave.			809	1060	.76	959	84
1961	950	14	964	1060	.91	1139	85
1962	1104	39	1143	1060	1.08	1667	69
1963	442	9	451	1095	.40	961	45
1964	338	12	350	1095	.32	711	49
1961-64 Ave.	709	19	728	1095	.68	1120	65
211							
1957-60 Ave.			166	245	.68	291	57
1961	138	7	145	245	.59	237	61
1962	86	0	86	245	.35	229	38
1963	92	8	100	245	.41	123	81
1964	50	1	51	245	.21	115	45
1961-64 Ave.	92	4	96	245	.39	176	56
212							
1957-60 Ave.			319	605	.53	603	53
1961	276	21	297	605	.49	511	58
1962	330	8	338	605	.56	575	59
1963	244	24	268	605	.44	589	46
1964	236	16	252	605	.42	515	49
1961-64 Ave.	272	17	289	605	.48	548	53
213							
1957-60 Ave.			182	195	.93	322	57
1961	92	0	92	195	.47	138	67
1962	57	0	57	195	.29	201	28
1963	30	0	30	195	.15	213	14
1964	57	0	57	195	.29	116	49
1961-64 Ave.	59	0	59	195	.30	167	35
214							
1957-60 Ave.			106	165	.64	223	48
1961	107	0	107	165	.65	184	58
1962	57	16	73	165	.44	231	32
1963	76	24	101	165	.61	208	48
1964	50	3	53	165	.32	142	37
1961-64 Ave.	73	11	84	165	.51	191	44
215							
1957-60 Ave.			215	435	.49	418	51
1961	214	0	214	435	.49	352	61
1962	186	8	194	435	.45	481	40
1963	199	8	207	435	.48	367	57
1964	155	3	158	435	.36	358	44
	189	5	194	435	.45	390	50

Table 8. Deer harvest from state-wide Questionnaire (continued)

Hunting Unit Year	Deer harvested by: Res.	Non-res.	Total	Area (sq.mi.)	Kill per sq.mi.	No. Hunters	% Hunting Success
Deerlodge Unit							
1957-60 Ave.			1907	2705	.71	2817	68
1961	1777	42	1819	2705	.67	2561	71
1962	1820	71	1891	2705	.70	3384	56
1963	1084	73	1157	2740	.42	2461	47
1964	886	35	921	2740	.34	1957	47
1961-64 Ave.	1392	55	1447	2740	.53	2591	56
Rock Creek Area (210 and 211)							
1957-60 Ave.			970	1305	.74	1250	78
1961			1109	1305	.85	1376	81
1962			1229	1305	.94	1896	65
1963			541	1340	.40	1084	50
1964			401	1340	.30	826	49
1961-64 Ave.			820	1340	.62	1295	63
Flint Range (Areas 212 and 213)							
1957-60 Ave.			501	800	.63	925	54
1961			389	800	.49	649	60
1962			395	800	.49	776	51
1963			298	800	.37	802	37
1964			309	800	.39	631	49
1961-64 Ave.			348	800	.44	715	49

Table 9. Mountain goat special permit hunting in the Deerlodge Unit

Hunting unit Year	Number permits	No. that hunted	Goats killed	Success of hunters	Sex killed Male	Sex killed Female	Number of applications for permits
212 - N. Flint Range							
1956	5	5	5	100	3	2	
1957	5	3	0	0	0	0	22
1958	5	4	2	50	1	1	23
1959	5	4	3	75	2	1	21
1960	10	10	2	20	2	0	26
1961	10	10	5	50	4	1	15
1962	15	13	6	46	5	1	31
1963	15	11	3	27	1	2	17
8 yr. total	70	60	26	43	18	8	
1964	10	10	2	20	2	0	26
213 - S. Flint Range							
1956	5	5	4	80	2	2	
1957	5	5	5	100	1	4	17
1958	5	5	4	80	3	1	31
1959	5	4	3	75	2	1	15
1960	0						
1961	0						
1962	3	3	3	100	1	2	7
1963	3	3	3	100	2	1	10
6 yr. total	26	25	22	88	11	11	
1964	3	3	2	67	2	0	7
214 - Mill Creek							
1959	10	9	7	78	5	2	13
1960	10	4	2	50	1	1	21
1961	10	9	7	78	3	4	17
1962	10	10	9	90	3	6	14
1963	15	14	8	53	6	1	43
5 yr. total	55	46	33	72	18	14	
1964	15	13	6	46	6	0	32
222 - Pintlar							
1956	25	18	8	44	2	5	
1957	40	32	20	62	11	9	88
1958	50	46	37	80	20	14	91
1959	40	34	7	21	3	4	88
1960	30	27	21	78	14	7	115
1961	30	28	19	66	8	11	106
1962	30	25	16	68	5	11	141
1963	30	25	9	30	2	6	142
8 yr. total	275	235	137	58	65	67	
1964	30	24	18	75	3	15	96

Table 10. Reported location of mountain goats killed in Deerlodge Unit

Hunting Unit Drainage or Landmark	1956-1960 No.	 %	1961-1963 No.	 %	1964 No.	Total No.	 %
212							
Dempsey Cr.-Mt. Powell	3	19	2	20	0	5	19
Racetrack Cr.-Racetrack Pk.	4	24	3	30	0	7	27
Rock Cr.-Goat Mountain	6	38	4	40	0	10	39
Boulder Cr.-Finley Basin	3	19	1	10	0	4	15
213							
Lost Creek-Lost Creek Falls	16	100	3	100	2	21	100
214							
Mill Creek-Mill Divide	3	33	5	23	2	10	26
Barker Creek-Mt. Haggin	4	44	6	27	2	12	33
Nelson Creek-Barker Divide	2	22	7	32	2	11	30
Twin Lakes Creek-Mt. Howe	0	0	3	14	1	4	9
Storm Lake Creek-Mt. Tiny	0	0	1	4	0	1	2
222							
Page Creek-Goat Flats	18	35	5	14	4	27	27
East Fork Rock Cr.-Rainbow Mountain	10	19	6	17	4	20	20
Seymour Creek-Seymour Lake	5	10	1	3	1	7	7
Carp Creek-Mt. Warren	5	10	4	11	0	9	9
Edith Lake-McGlaghlin Peak	4	8	1	3	1	6	6
Falls Creek-East Pintlar Pk.	7	14	9	25	0	16	16
Middle Fk.Rock Creek-West Pintlar	2	4	3	7	1	6	6
Fishtrap Creek-Goat Pks.	0		5	14	1	6	6
Thompson Creek-Lion Lake	0		2	6	1	3	3

Table 11. Moose special permit hunting in the Deerlodge Unit (either sex permits)

Hunting Unit Year	Number Permits	Reported killed	% Success	Number applications for permits	Sex and Age of moose harvested No. Males	No. Females	No. Adults	No. Calves
212 - N. Flint Creek Range								
1956	10	8	80		5	3	8	0
1957	15	13	87	111	7	6	10	3
1958	15	14	93	129	8	6	12	2
1959	15	14	93	157	6	7	12	1
1960	10	10	100	137	7	3	7	3
1961	10	9	90	124	3	4	6	1
1962	20	11	53	153	4	7	10	1
1963	15	11	73	144	9	1	9	1
Total(8 years)	110	90	82		49	37	74	12
1964	15	12	80	141	4	6	11	1
214 - Mill Creek								
1957	5	4	80	10	2	2	3	1
1958	5	5	100	29	2	3	4	1
1959	2	2	100	28	1	1	2	0
1960	2	2	100	23	2	0	1	1
1961	3	3	100	23	0	3	3	0
1962	5	5	100	31	4	1	4	1
1963	5	5	100	44	3	2	5	0
Total(7 years)	27	26	96		14	12	22	4
1964	5	5	100	56	3	2	5	0
216 - West Flint Creek								
1956	10	6	60		2	4	6	0
1957	10	7	70	27	4	3	7	0
1958	10	5	50	28	3	2	5	0
1959	5	5	100	11	3	2	4	1
1960	3	3	100	17	1	2	3	0
1961	5	5	100	16	2	2	3	1
1962	5	3	60	14	2	1	3	0
1963	5	5	100	8	4	1	5	0
Total(8 years)	53	39	74		21	17	36	2
1964	5	4	80	14	3	0	3	0
217 - E. Fork Rock Creek								
*1956	30	25	83		8	12	16	4
1957	5	5	100	10	2	3	5	0
1958	5	3	60	19	3	0	1	2
1959	3	2	67	8	2	0	2	0
1960	3	3	100	10	1	2	3	0
1961	9	8	90	41	3	3	6	0
1962	10	9	90	35	6	3	8	1
1963	10	8	80	33	2	5	7	0
Total(8 years)	75	63	84		27	28	48	7
1964	10	8	80	28	5	2	7	0

Table 11. Moose special permit hunting in the Deerlodge Unit (either sex permits)

Hunting Unit Year	Number permits	Reported killed	% Success	Number applications for permits	Sex and Age of moose harvested No. Males	No. Females	No. Adults	No. Calves
218 - W. Fork-Ross Fork								
1957	20	18	90	148	8	10	14	4
1958	25	20	80	211	5	4	8	1
1959	5	5	100	74	4	0	4	0
1960	5	5	100	46	3	2	5	0
1961	10	9	90	70	4	5	9	0
1962	5	5	100	31	1	4	5	0
1963	5	5	100	37	4	1	5	0
Total (7 years)	75	67	89		29	26	50	5
1964	5	3	100	31	1	1	3	0
219 - Lower Rock Creek								
1958	5	4	80	34	4	1	5	0
1959	3	3	100	21	3	0	3	0
1960	3	2	67	20	1	1	2	0
1961	10	10	100	48	3	7	10	0
1962	15	15	100	87	9	6	13	2
1963	15	12	80	83	4	8	11	1
Total (6 years)	51	46	90		24	23	44	3
1964	15	12	80	93	7	5	10	2

*Included both areas 217 and 218

Table 12. Reported location of moose kills in Deerlodge Unit

Hunting Unit Drainage	1956-1960 No.	%	1961-1963 No.	%	1964 No.	Total No.	%
212							
Gold Creek	12	25	10	27	3	25	26
Blum Creek	1	2	0	0	0	1	1
Willow Creek	1	2	1	3	0	2	2
Rock Creek	4	8	6	16	2	12	13
Prison Ranch-Tincup Joe	12	25	4	11	0	16	17
Dempsey Creek	2	4	1	3	0	3	3
Racetrack Creek	9	20	3	8	1	13	14
Red Lion	2	4	2	6	0	4	4
Boulder Creek	2	4	2	6	2	6	6
Douglas Creek	1	2	1	3	0	2	2
Dingwall Ranch	1	2	2	6	0	3	3
Fred Burr	0	0	3	8	1	4	4
Rumsey Gulch	0	0	1	3	1	2	2
Lost Creek	1	2	(not open)			1	1
214							
Mill Creek	10	100	9	69	2	21	75
Greys Gulch	0		2	15	1	3	11
Clear Creek	0		1	8	0	1	3
Storm Lake Creek	0		1	8	2	3	11
216							
Lower Willow	6	40	4	27	1	11	34
Henderson-Smart Creeks	3	20	1	6	0	4	12
Upper Willow	5	33	8	53	1	14	44
Tyler Creek	1	7	0	0	1	1	3
Marshall Creek	0	0	1	7	0	1	3
Preachers Gulch	0	0	1	7	0	1	3
217							
Middle Fork Rock Cr.	2	40	9	39	4	15	44
Copper Creek	2	40	9	39	1	12	35
Meadow Creek	1	20	3	13	1	5	15
Darby Meadows	0		2	9	0	2	6
218							
Lower Ross Fork	10	26	8	35	0	18	28
West Fork Rock Creek	19	50	8	35	0	27	42
Medicine Lake	6	16	7	30	2	15	24
Lake Abundance	1	3	0		0	1	2
Above Gillis Bridge	1	2	0		0	1	2
McKay Gulch	1	2	0		0	1	2
219							
Rock Creek Bottoms	4	80	24	75	5	33	70
Brewster Creek	0	0	3	9	1	4	9
Ranch Creek	0	0	2	7	0	2	5
Hogback Creek	0	0	1	3	0	1	2
Butte Cabin Creek	0	0	1	3		1	2

Table 12. Reported location of moose kills in Deerlodge Unit (continued)

Hunting Unit Drainage	1956-1960 No.	 %	1961-1963 No.	 %	1964 No.	Total No.	 %
219 (cont'd)							
West Fork Rock Creek	0	0	1	3		1	2
Stoney Creek	1	20	0	0		1	2
Schwartz Creek					1	1	2
Spring Creek					3	3	6

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT

State of Montana Name Wildlife Investigations, District 2

Project W-72-R-13 Title Big Game Surveys and Investigations -

Job No. A-2 Clark Fork Unit Re-check

Period Covered July 1, 1967 - June 30, 1968

Abstract:

The winter of 1967-68 was mild for big game. Timber harvest has continued to be active in the unit with near 38,000 acres of National Forest and Anaconda Forest Products lands cut-over during the four year period 1963-1966. The construction of over 375 miles of primary logging roads during this period has made more areas accessible by vehicle. Intensified farming has caused increased conflicts between agriculture and big game. Sales of deer and elk tags to residents in Mineral and Missoula counties decreased 12% but sale of non-resident $100/$125 licenses increased 2.5% in these counties in 1967 compared to 1966.

Limited population trend information indicates the elk and mule deer populations are going down, while white-tailed deer numbers are increasing. Productivity checks indicate that elk production has been good and deer production fair the past few years. Losses due to old age, predation, and malnutrition have tended to be light. A significant number of deer and elk are believed killed on the highway and two railroads each year.

Generally the trend in condition of big game winter ranges is up in the Clark Fork Unit. Average browse utilization was 26% of leaders after the 1967-68 winter. Palatable browse species increased 4.2% in density from 1963 to 1967 at eight sites checked by line intercept transects. At the Eddy Creek Exclosure, non-grazed browse plants gained 19% in height while plants outside that had been grazed over a ten year period were 2.4% shorter. Lighter spring use by game was noted on moist bottoms.

Hunting regulations have remained about the same the past four year period. The hunter questionnaire results indicated the 1967 elk and deer harvest in the Clark Fork Unit was highest of recent years. The highest proportion of the elk harvests was made in the early portion of the hunting season. The proportion of cow elk harvested has increased. The proportion of white-tailed deer harvested has increased in recent years in the unit. Success on moose permits has been lower in area 23 the past four years. A shorter season for either sex elk is recommended.

Objectives:

To determine the status and trend of big game populations and their habitat in a more intensive manner than can be accomplished during the District-wide surveys.

Procedure:

1. Field surveys were conducted to determine the current status of big game populations and habitat. Past reported observations were used as a basis for determining trend whenever possible.

2. Permanent type range transects and pellet group plots were re-checked to determine trends in relative use by big game and in range condition. This work was done on a cooperative basis with the Forest Service in some areas.

3. Winter herds of big game were sampled by ground and aerial observations to determine sex and age composition, numbers, and mortality.

4. One permanent checking station was operated to sample the big game harvest for biological information and determine when the quota number of elk was taken. Data obtained by the statewide questionnaire for the hunting areas in the Clark Fork were analyzed.

5. Data were analyzed and a report prepared with recommendations for management and plans for accumulating management information.

Findings:

Habitat and Land Use Trends

Location and Description

The Clark Fork Unit is made up of approximately 1 1/3 million acres of mountainous lands, located primarily to the west of Missoula. The valleys in the area tend to be narrow with less than two percent of the unit cultivated. Seventy-eight percent of the unit is forest type of which a large portion was burned over by wild fires in 1910 and 1919.

Trend in Climate

The Clark Fork Unit varies from 2,550 feet to over 9,000 feet in elevation. It normally has somewhat more snowfall, but an earlier spring, particularly in the western portions, than the remainder of District Two. The complex of temperature and precipitation during the period of November through March each year is believed to be an indication of the severity of the winter for big game. Average winter temperatures and amounts of precipitation at Superior, elevation 2710 feet, are given below:

Winter*	Average temperature (degrees F)	Total precipitation (Inches)	Relative rating for big game
1964-65	31.7	11.15	Normal
1965-66	34.3	9.87	Normal
1966-67	35.5	9.03	Normal
1967-68	31.7	4.57	Mild
Prior 20 year Ave.	30.2	7.59	

*Five month period from November to March

The past four winters have rated normal or mild for big game as temperatures have been above average and prevented a build-up in snow depth. Only two winters in the past fifteen years have been severe for big game by having both below average temperature and above average precipitation.

Vegetative Cover Trends

Accelerated logging has opened up near 100,000 acres in the Unit in the past eight years (11 percent of the timbered lands). However, rapidly-growing timber in the unit is invading the old burns and openings and probably counteracting the effects of the logging. The trend in age class of the timbered area is toward more young timber stands and less mature age stands. No large forest fires have occurred the past few years in the unit.

Ownership Trends

Ownership of lands in the Clark Fork Unit has not changed significantly. Small tracts have changed hands, but their status has remained the same. The price of land has increased considerably in the unit in recent years.

Approximately 70% is National Forest land, 13% small private, 10% Anaconda Company, 3% State School lands, and 4% Northern Pacific land.

Trend in Economy

Agriculture is probably the most stable industry in the unit. However, the amount of lands suitable for farming is relatively small. More intensified agricultural practices have caused increased problems with big game in some instances. Reseeding of foothill pastures and increased use of commercial fertilizer on fields adjacent to game winter range has proved attractive to elk and deer with subsequent complaints of game damage by landowners.

The timber industry is the major activity in the unit. Several relatively large mills and a paper-pulp plant are present, and considerable timber is shipped to mills outside the unit. Areas logged the past four years and new main-haul roads constructed are as follows:

Hunting district	Areas selective cut	Acres clear-cut	Acres in winter range zone	Miles new access road
20	2,240	1,450	390	55
21	5,685	2,145	1,000	43
22	7,875	2,605	1,850	120
23	10,863	5,355	2,400	141
Clark Fork Unit	26,663	11,555	5,640	359

The timber harvest has been somewhat less the past four years than the prior four year period. The proportion of logging occurring above the winter range zone has been 85.2%. The timber removal has been generally favorable for big game by providing more ground forage, improving access, and increasing the amount of early winter and spring range. In some areas livestock can be shifted to these higher openings from the more critical foothill ranges.

There have been no large forest fires in the unit in recent years. The timber is becoming dominant on most of the old 1910-1919 burns. This is unfavorable for big game, especially where it is occurring on big game winter ranges. Thick timber stands eliminate browse and other low vegetation which the game animals depend on for food.

Mining continues to be a minor activity in the unit. Several small mines are operating and there is some active prospecting.

Recreation is very important in the Clark Fork Unit. The Forest Service estimates recreational visits have increased steadily on National Forest lands in recent years. Fourteen licensed outfitters operated in the unit in 1967. A summary of big game license sales in Mineral and Missoula counties is given below:

	Resident Big Game		Non-resident $100 Big Game	Total Big Game Licenses
1933	2,170		6	2,176
1943	3,652		56	3,708
1953	7,694		178	7,872
1963	10,166		632	10,798
	Elk tags	Deer tag "A"		
1966	11,008	11,516	725	
1967	9,437	10,547	744	

Major highway construction is in progress in the unit. The right-of-way required for the interstate highway and frontage roads will take a significant portion of the narrow Clark Fork and St. Regis River valleys.

Access Status

It appears that the trend on private land is toward less land open to free public use. Land owners report careless shooting, littering, failure to leave gates as they found them, destruction of equipment, theft of equipment, and livestock, etc., as reasons they are closing their lands to the public. There are some instances where, because of private holdings at the mouth of small canyons, access is denied to public lands above. Timber harvest roads have in some cases provided access to these public lands.

Game Resource Trends

History

Old-timers in the area report that white-tailed deer, mule deer, elk, and black bear were common and mountain sheep were present in portions of the Clark Fork Unit in the late 1800's, when the miners began to come into the area. Big game was hunted year around for food at the mining camps, and as a consequence, by about 1910 the sheep were eliminated and the elk and deer populations greatly reduced.

During the period 1910 to 1940, hunting regulations were conservative, elk from Yellowstone Park were released in several areas, and much of the unit was put into game preserve status. Elk and deer increased during this period. Portions of the unit became famous for their high deer populations.

From 1935 to 1955, periodic game studies indicated the game population was too large for the amount of forage available on some winter ranges. Significant deer mortality, due in part to malnutrition, occurred during the more severe winters. During the 1955-56 severe winter, moderate numbers of elk and large numbers of deer died of malnutrition in portions of the unit.

Population Trends

Past investigations have been sporadic and limited in scope and records of population size are meager. Thus, it is not possible to determine precise trends in the big game populations in the Clark Fork Unit. However, general observations and records suggest that the deer population was highest in about 1948 and elk numbers in the Unit probably reached a high in about 1955.

Based on harvest, forage trends, and general observations it seems probable that; (1) elk numbers have declined gradually the past twelve years, (2) white-tailed deer numbers have increased the past five years, and mule deer numbers have decreased slightly during the past twelve years.

The high proportion of the Clark Fork Unit that is timbered limits aerial counting of big game. Aerial reconnaissance counts in the Petty-Burdette-Lupine Creeks burn have been made with the following observations: 1960- 95 elk, 1964- 167 elk, and 1968- 79 elk. The number of elk observed in this relatively high elevation area may be significantly influenced by severity of the winter as well as other factors. The 1967-68 winter was normal up to the time these observations were made.

Herd Composition and Productivity

Sex and age classes of big game observed in the Clark Fork Unit in 1967-68 and past years is given in Tables 1, 2, and 3.

Productivity of deer was indicated to be lower during the period 1965-1968 than during the 1961-64 period. Mule and white-tailed deer productivity in the Clark Fork Unit would rate fair relative to other deer herds.

Elk productivity would rate good relative to other elk herds. Productivity of elk was indicated to be slightly lower during the 1965-68 period than in prior years.

Trend in Population Losses Other Than Hunting

There are continual losses to animal populations due to disease, accident, and malnutrition. These losses tend to be minimized by adequate harvest by hunting each fall.

Two transcontinental railroads, and a U.S. Highway traverse the big game winter ranges along the Clark Fork and St. Regis Rivers. Annual losses due to collision on the tracks and roads are estimated at 350 deer and 10 elk. Most of these losses occur in the late winter and early spring.

The extent of losses due to disease is not well known. A few elk with scabies are reported shot or observed in the unit each year. No sick animals were observed during the past year.

Losses due to malnutrition and old age are believed to be lower in recent years in the unit.

Losses due to predators are not believed to be large. Coyotes are controlled by 1080 poison along the fringe of farm lands and considerable interest is shown in "cat" hunting with hounds. Domestic dogs are becoming somewhat of a problem as more people move to the suburban gulches which in many cases are big game wintering areas.

Losses due to poaching are believed to be increasing with more roads and higher meat prices.

Trend in Distribution

No major change in big game distribution is evident. However, some former elk wintering areas were not used during the winter of 1967-68 due possibly in part to constant harassment by people using the recently built logging roads in vehicles and over-snow machines. It may be necessary to restrict travel on some important elk winter ranges during the winter months.

Trend in Big Game Forage

History

Excessive utilization of the preferred browse species has been reported on winter ranges in portions of the unit since the first game studies in 1935. By 1942 use on conifers was reported to be excessive and some winter ranges were being "high-lined" by deer eating everything green as high as they could reach. Significant numbers of dead deer were found late in the severe winters of 1948-49, 1950-51, and 1955-56. Physical condition of the bones indicated malnutrition as a factor in nearly all dead deer examined. Browse study plots indicated lighter use and slight improvement in condition of browse

from 1956 to 1962. Slight improvement, but an increase in over-all use of browse occurred from 1962 to 1965.

Trend in Range Conditions 1964-1968

Generally, the condition of big game winter ranges appeared to be very slightly improved.

Results of browse plot checks in the spring of 1968 are given in Table 4. Based on state-wide standards the Clark Fork Unit rated "fair" for browse condition (21% severely hedged). Leader use averaged 26% of leaders. The high proportion of decadent plants (35%) suggests a general trend toward the plants dying because of old age, plant succession, and overuse.

Trend in browse condition and utilization in the Clark Fork Unit is shown in Table 5. All hunting units showed improvement in browse conditions the past several years. Utilization was highest during the winter of 1967-68 of the past four years.

Pellet group density at the browse transect sites is given in Table 5. The number of both elk and deer groups was lower in 1968 than of the past four year period. The highest numbers of both deer and elk pellet groups during the past few years were checked in 1962.

Line intercept transects, which reflect vegetative composition and density, were rechecked at eight sites in the Clark Fork Unit. The results are shown in Tables 6 and 7. Palatable browse increased 4.2% from 1963 to 1967. Palatable species that increased were serviceberry, chokecherry, evergreen Ceanothus, and redstem Ceanothus. The low growing shrubs, kinnikinnick and Oregon grape were less dense in 1967 than they had been in 1963 on the transect sites. Species of browse not palatable to game animals increased 34% on the transect sites (spirea showed greatest increase).

Density of palatable browse, grass, and forbs was lower in Area 21, but the unpalatable browse species increased from 1963 to 1967.

The palatable browse species increased and the unpalatable browse species, grass and forbs decreased in area 22.

In area 23, palatable browse increased 36%, grass decreased 65%, and forbs decreased 45%.

Although no conifers were recorded on the lines checked, it appeared that they were becoming more dominant and starting to "take-over" at some sites.

A game and livestock proof exclosure was constructed on Eddy Creek in 1957. Ten transects were established inside and ten outside to inventory the vegetation. These transects have been "read" in 1959, 1963, and 1967. The results are summarized as follows:

Grazed control	Average percent of intercept 1957	1963	1967	Change 1963-67
Palatable species	20.85	21.57	30.0	+ 28%
Unpalatable species	1.41	1.65	6.5	+ 75%
Ungrazed exclosure				
Palatable species	25.31	38.9	49.2	+ 21%
Unpalatable species	2.03	1.6	3.0	+ 47%

Both palatable and unpalatable browse species showed considerable increase in density both under non-use and moderate to heavy use.

A sample of browse plants at the Eddy Creek Exclosure site were tagged and their height measured in 1957. These plants (which were still alive) were remeasured in 1967 and results are shown below:

Outside check plot	1957 Max. ave. ht.	1967 Max. ave. ht.	Trend
14 Amelanchier plants	2.42	2.18	-10%
7 Ceanothus velutinus	1.51	1.77	+15%
1 Chokecherry	1.6	1.9	+16%
Total Ave.	2.09	2.04	-2.4
Inside exclosure			
26 Amelanchior plants	2.98	3.57	+17
2 Ceanothus velutinus	1.4	2.1	+34
1 Willow	5.0	8.5	+41
Total ave.	2.94	3.64	+19.2

The plants under non-use gained more height than those used moderately to heavy in the ten year period.

During the summer of 1959 a field survey of the Clark Fork Unit showed that conifers were highlined in 15 areas totaling 4,270 acres. Ungrazed seedlings and axil sprouts were noted in these areas on inspections since that time, suggesting light conifer use the past few years. However, the old high-line on the conifers is still evident over these areas.

There are only limited grasslands in the Clark Fork Unit. Most are in the form of small moist stream bottom meadows. Elk use has at times been quite heavy on some of these meadows in the spring and early summer. However, by 1967 roads have been built through these meadows and elk use was very light in the springs of 1967 and 1968.

A small exclosure was constructed in the old Petty Creek Pasture on an open south slope. Use has been 20-40% by game and horses the past several years. Observations in 1968 indicated that more weedy species were present inside the exclosure than outside, suggesting possible effects of game use on the weedy species. The slope has improved but patches of cheatgrass and bare soil are still present.

Land Use Problems

The extent of actual competition between deer, elk, and livestock in the Clark Fork Unit is not well known. Livestock and game do use many of the same range areas. However, the cattle tend to use the bottoms and areas close to water much more than the game. Probably the site of most frequent overlap of use is the ridge tops in the winter range zone. Little competition exists on the high summer range areas.

Over 50 percent of the big game winter range is privately owned. Consequently, the numbers of elk and deer that can be maintained in the Clark Fork Unit depends, to some degree, on how the owners use these lands, and on how much game use the private landowners will tolerate. Complaints regarding big game use on private lands have been received from all hunting areas in the Clark Fork. Complaints were fewer from 1963 to 1965, but increased in 1967.

One farm west of superior has a long history of elk and deer damaging crop land by heavy use in the spring. Several farms southwest of Lolo have made more urgent complaints of game damage since reseeding and fertilizing their foothill pastures. Elk and deer appear to prefer the fertilized vegetation and alfalfa in particular. Thus, when normal forested winter-spring game range abuts cropland or improved pasture the game tend to concentrate on the cropland to feed. Actual damage to the crops due to game use is not known.

Livestock grazing on National Forest lands has been reduced in recent years. All domestic sheep permits have been terminated. Cattle and horse permits have been reduced by lower numbers and shorter season of use. Less trespass horse use has been tolerated. However, less use on Forest lands quite frequently results in greater use on private and leased lands at the lower elevations, which are also important as game wintering areas.

Adjustments in Land Use

It appears that generally the harvest of timber has been, and will continue to be, beneficial to big game from the forage standpoint. It would be desirable to harvest more timber on the key winter ranges to prevent conifers from dominating these sites.

The available forage supply in the winter range zone is the primary key to the number of big game animals it is possible to carry in an area. On some of these winter range areas, the combined use of big game and livestock is too great and, as a result, at least portions are in poor condition. A possible adjustment that would favor big game in such areas would be reservation of forage for game use in the winter and spring. Where these lands are privately owned, it would seem wise to investigate the possibility of acquisition of grazing rights by land purchase or lease. When such lands are in public ownership, the administering agency should be requested to reserve the forage for game use.

Game range acquisition and maintenance will logically be costly and have to be limited in extent. Thus, full investigation should be made of potential sites to be certain they will logically attain the desired goals.

Experimental Game Habitat Improvement

In July, 1961, the U.S. Forest Service sprayed approximately 40 acres of browse type land in Dry Creek with herbicide and burned it in the fall. This site had a high percentage density of ninebark and most browse plants were old - many had grown out of reach of game animals. The purpose was to kill back the browse and determine if such treatment would provide more game forage.

Two line-intercept transects were established a few days before treatment. These transects were re-read in July 1963, 1965, and 1967. Results are shown below:

Feet of Browse Intercept in 200 Feet and Vegetative Hits at Foot Marks

Year	Serviceberry	Red-stem Ceanothus	Ninebark	Snowberry	Grass hits	Forb hits
1961	1.8	6.2	53.8	5.8	13	1
1963	0	0	35.0	12.4	38	50
1965	.3	2.0	51.1	13.8	28	21
1967	3.1	3.9	54.8	11.2	25	3

After six years the site appears to be returning to about the same vegetative composition as it was before treatment.

On the St. Regis District a study is in progress to evaluate the effects of clear-cutting and burning of timber lands on the game winter range. Results to date indicate good stands of browse and grass will establish themselves on these clear-cuts.

Also on the St. Regis district in 1963 the conifers on a ten acre area were cut to determine the value of hand clear-cutting as a tool to increase browse and other low growing vegetation. Observations to date show

considerable young conifers apparently missed as seedlings, but no vegetative trend is apparent yet.

GAME MANAGEMENT

History

Year-long hunting by miners, loggers, and early settlers from about 1875 to 1910 apparently resulted in reduced big game numbers. Conservative seasons, creation of large game preserves, restocking of elk, and more effective game law enforcement resulted in increased elk and deer populations during the period 1910 to 1940. Winter big game studies in the 1940's indicated that winter ranges in several portions of the unit were being overused. Thus, hunting regulations were gradually liberalized and all game preserves were abandoned.

Either-sex deer hunting was allowed in portions of the unit for three days in 1951 and the either sex part of the season increased until all seasons have been for either sex since 1955. Two deer were allowed each hunter from 1956 to 1960 in at least portions of the unit. Extended seasons for elk and deer in the more critical winter range areas occurred from 1955 to 1967.

Regulations

A summary of elk and deer hunting regulations in the Clark Fork Unit from 1964 to 1967 is given in Table 8. The regulations have remained about the same during the four year period. Opening and closing dates have tended to be one week later the past several years. The season on elk has been on a quota checked basis in area 20.1 in 1966 and 1967.

Trend in Big Game Harvest

Information concerning the big game harvest in the Clark Fork Unit has been gained by checking station operations, hunter questionnaires, and field checks.

A checking station was operated at St. Regis in 1966 and 1967. The numbers of big game and hunters checked are shown below:

	Elk	Mule Deer	W.T. Deer	Hunters
1965	112	52	34	-
1966	153	45	40	1024
1967	109	35	22	808

Numbers of elk, deer, and hunters checked were lower in 1967 than other years.

Returns from the questionnaire sent out to every tenth big game license buyer are shown in Tables 9 and 10. These results indicate that more elk and deer were harvested from the Clark Fork Unit in 1967 than other recent years. They suggest that the 1967 harvest was 29% higher for elk and 16% higher for deer than the prior ten year average in the Clark Fork Unit.

When considered by hunting unit the questionnaire results indicate:

Area 20: North Superior: The highest kill of deer occurred in 1961 and the highest kill of elk in 1967. The 1967 kill of elk was 44% above the prior ten year average and the 1967 kill of deer was 7% below the prior ten year average.

Area 21: Ninemile: The highest harvest of elk was in 1961 and the highest harvest of deer in 1967. The 1967 harvest of deer was 36% higher than the prior ten year average kill. The 1967 harvest of elk was 22% more than the prior ten year average kill.

Area 22: South Superior: The highest kill of deer was in 1958 and the highest kill of elk was in 1961. The 1967 elk harvest was 25% larger than the previous ten year average kill. The 1967 deer harvest was 6% below the prior ten year average kill.

Area 23: Lolo-Petty-Miller Creeks: This hunting unit was enlarged in 1963. Since that time, the greatest deer and elk harvest was made in 1967.

The St. Regis checking station accounted for 14.5% of the elk and deer reported killed in hunting district 20.1 and 4% of the elk and deer reported killed in hunting district 22 by the questionnaire.

Distribution of Kill by Portions of the Hunting Season

The distribution of kill, based on animals checked at St. Regis checking station is shown below:

	Elk		Mule deer		White-tailed deer	
	No.	% total	No.	% total	No.	% total
Early season (9/23-10/21)	59	45	11	26	5	12
Regular season(10/22-11/19)	41	31	14	33	19	48
Late season (11/20-11/30)	31	24	18	42	16	40

The highest proportion of the elk kill was made during the early season time period. Most of the deer were taken during the regular and late season time period.

Sex and Age of Animals Harvested

A summary of sex and age of elk and deer checked in the Clark Fork Unit is given in Table 11.

During the three years that St. Regis Station has been operated (1965-66-67) elk were taken in a ratio of 104 bulls:100cows:32 calves, mule deer in a ratio of 155 bucks:100 does:19 fawns, and white-tailed deer in a ratio of 156 bucks:100 does:47 fawns. The harvest of more bulls and bucks than females is desirable in these polygamous species.

The sex and age of elk harvested in the Clark Fork Unit based on the hunter questionnaire results is given in Table 12. The proportion of spike bulls has been lower since 1963 than it was 1960-63. The proportion of bulls to cows harvested was indicated to be lower in 1967 than prior years. The proportion of calves to cows was lower in 1967 than past average.

The ratio of kill is believed to be influenced by hunter preference, weather conditions during the season, time of season, etc., as well as productivity of the herds. Usually, when more females than males are harvested, the population size is reduced.

When possible, elk and deer have been aged by dental examination. A summary of results is given in Table 13. Samples have been low due to low numbers checked and the fact that many hunters fail to bring in the head or jaws. The proportion of yearling elk and mule deer has been lower since 1960. The proportion of yearling white-tailed deer has been higher since 1960. The proportion of old elk has increased, while the proportion of old deer harvested has decreased. Generally a higher ratio of the younger age class animals have been taken during the early portions of the season and the "old" animals are taken close to the season's end.

The proportion of deer by species and ratio of deer to elk harvested is shown in Table 14. The proportion of white-tailed deer harvested in the Clark Fork Unit has shown an upward trend since 1960. However, a lower proportion of white-tails were taken in areas 20 and 22 in 1967 compared to 1966. The proportion of elk to deer harvested has been greater in hunting district 20 and 22 since 1962. The proportion of elk to deer has been lower in district 21 and 23 since 1962.

Elk and Deer Harvest per Unit Area

The kill of elk and deer based on hunter questionnaire returns and the hunting unit size is given in Tables 9 and 10. More deer were harvested per unit area in hunting district 21 during the ten year period 1957-1966 and in 1967 than other areas in the Clark Fork Unit (1.59 deer per square mile 10 year average). More elk per square mile area were harvested in hunting district 22 during the ten year period 1957-1966 (1.04 elk per square mile) than other districts of the Clark Fork Unit. The highest elk kill per square mile occurred in Hunting District 20 in 1967.

Trend in Hunting Conditions

The weather preceding and during the hunting season is believed to be one of the more important factors in the amount of game harvested. The accumulation of snow is generally favorable for hunting by causing the game

animals to drift to lower, more accessible areas and giving the advantage of "tracking snow." Warm rainy periods are usually low harvest periods. Extremely cold weather and storms tend to limit travel by hunters from the more distant population centers. With the increase in roads, four-wheel drive vehicles, and over-snow vehicles, snow is possibly not restricting the hunter as much as it has in the past. Thus, an appraisal of the effects of weather on harvest is difficult.

A summary of weather during the past four hunting seasons is given below:

	Average Fall* Temperature (Deg. F)	Total Precipitation (Inches)	Adjective Rating for Hunting[1]
24 year average	40.3	3.44	
1964	42.7	3.02	Unfavorable
1965	44.3	1.58	Unfavorable
1966	42.5	3.43	Unfavorable
1967	41.8	3.53	Average

*October and November averages at Superior

[1]Above average temp. and below ave. ppt. = unfavorable
Above " " " above " " = average
Below " " " below " " = average
Below " " " above " " = favorable

The above criteria suggests that the 1967 season was about average weatherwise for hunting.

Trend in Moose Harvest

Moose have been hunted on a special permit basis in Area 23 since 1959. Results are shown below:

	No. Permits	Number moose killed	% Success	Bulls	Cows
1959-1963 total	15	13	87	3	7
1964	10	2	20	1	1
1965	10	6	60	1	4
1966	10	6	60	2	3
1967	10	3	30	1	2
1964-67 total	40	17	43	5	10

The area was increased in size in 1964 and the number of permits increased accordingly. Success has been lower since 1964 than from 1959-63.

Adjustments in Game Management

Restocking: Eighteen bighorn sheep from the Sun River area were released on Petty Creek in February 1968. Reports to date indicate considerable dispersion of these sheep within a month after release.

Closures and Preserves: There have been no closures or preserves in the Clark Fork Unit the past several years. It is believed that none are needed.

Predator Control: The predators in the Clark Fork are subject to control by livestock growers, hound hunters, and others. No need of predator control to benefit game is believed necessary.

Artificial Feeding: There has been very little artificial feeding of big game in the past in the Clark Fork Unit. Feeding game has been discouraged.

Game Salting: The value of salt for game is not well known. Salt put out for livestock is used by game, but it is believed they can live without it and its value to affect distribution is limited.

Hunting Regulations: In light of generally improving range conditions it appears that the harvest in most of the Clark Fork Unit could be slightly lower for elk and about the same for deer. Logging roads have made most of the Unit accessible via motor vehicles. This tends to accelerate the rate of kill and it is probable that an adequate harvest of elk can be made with a shorter either-sex season.

It is believed that the number of cow elk taken can be reduced slightly in some areas but a full harvest of bulls should be made. The number of cows present each winter will determine the amount of increase the next year far more than the carry-over of bulls which have performed their purpose in the reproductive cycle, usually before the hunting season ends. Thus, a relatively short either sex season followed with an antlered bull season is suggested.

Game Management Recommendations:

1. It is recommended that range trend and condition plots, browse transects, pellet plots and seasonal reconnaissance of key game ranges be continued in cooperation with the Forest Service to determine trend in range plant condition and utilization.

2. It is recommended that composition of the elk and deer herds be checked annually to determine productivity of the big game herds.

3. It is recommended that permit hunts for moose be continued in hunting district 23.

4. It is recommended that big game seasons in as much of the Clark Fork Unit as possible open in late September to allow a maximum opportunity to hunt.

5. It is recommended that the season for either sex elk be shortened, but the taking of antlered bulls be continued to near December 1 each year.

Prepared by: Fred L. Hartkorn Approved by: Wynn G. Freeman

Date: June 25, 1968

Table 1. Sex and age of mule deer observed in the Clark Fork Unit

Hunting area	Year	Bucks	Other adults	Fawns	Fawns/100 adults
20	1961-64	14	134	70	47
	1965	14	26	10	25
	1966	0	48	20	42
	1967	0	0	0	0
	1968	10	31	15	37
	1965-68	24	105	45	35
21	1961-64	0	47	18	38
	1965	0	0	0	-
	1966	0	0	0	-
	1967	0	0	0	-
	1968	9	13	9	41
	1965-68	9	13	9	41
22	1961-64	30	276	205	67
	1965	15	50	11	17
	1966	1	45	11	24
	1967	2	9	5	45
	1968	16	108	64	52
	1965-68	34	212	91	37
23	1961-64	23	76	44	44
	1965	7	39	18	39
	1966	1	29	12	40
	1967	0	0	0	-
	1968	7	98	57	54
	1965-68	15	166	87	48
Clark Fork Unit					
	1961-64	67	533	337	56
	1965	36	115	39	26
	1966	2	122	43	35
	1967	2	9	5	45
	1968	42	250	145	49
	1965-68	82	496	232	40

Table 2. Sex and age of white-tailed deer observed in the Clark Fork Unit

Hunting area	Year	Bucks	Adults	Fawns	Fawns/100 adults
20	1961-64	25	277	162	54
	1965	9	64	35	48
	1966	2	105	35	34
	1967	2	7	5	56
	1968	10	174	105	57
	1965-68	23	350	180	48
21	1961-64	4	99	58	56
	1965	6	33	15	38
	1966	0	44	26	59
	1967	0	0	0	-
	1968	0	12	5	42
	1965-68	6	89	46	48
22	1961-64	10	171	141	78
	1965	5	7	1	-
	1966	12	51	23	37
	1967	4	0	0	-
	1968	3	42	20	44
	1965-68	24	100	44	35
23	1961-64	12	105	67	57
	1965	5	35	12	30
	1966	7	71	28	36
	1967	1	18	9	47
	1968	1	78	33	42
	1964-68	14	202	82	38
Clark Fork Unit					
	1961-64	51	652	428	61
	1965	25	139	63	38
	1966	21	271	115	39
	1967	7	26	14	44
	1968	14	383	163	43
	1965-68	67	819	355	41

Table 3. Sex and age of elk observed in the Clark Fork Unit

Hunting area	Year	Adult bulls	Spikes	Cows	Calves	Bulls:Cows:Calves
20	1964	17	8	99	42	25:100:42
	1965	15	5	52	23	38:100:44
	1966	12	9	61	22	34:100:36
	1968	2	3	29	14	17:100:48
	1965-68	29	17	142	59	32:100:42
21	1964	5		16	6	31:100:38
	1968			5	2	- :100:40
22	1964	27	10	116	49	32:100:42
	1965	0	2	22	12	9:100:55
	1966	4	5	96	29	9:100:31
	1967			24	8	- :100:33
	1968	8	12	86	39	23:100:45
	1965-68	12	19	228	88	14:100:39
23	1964	31	28	156	77	38:100:49
	1965	4	1	11	5	45:100:45
	1966	23	19	200	61	21:100:31
	1967	2	6	51	24	16:100:47
	1968	10	5	109	60	14:100:55
	1965-68	39	31	371	150	19:100:40
Clark Fork Unit						
	1964	80	46	387	174	33:100:45
	1965	19	8	85	40	32:100:47
	1966	39	33	357	112	20:100:31
	1967	2	6	75	32	11:100:43
	1968	20	20	229	115	17:100:50
	1965-68	80	67	746	299	20:100:40

Table 4. Browse transect results, Clark Fork Unit 1968

District Site	Species	Percent severely hedged	Percent decadent	Percent leader use	Pellet groups /acre Deer	 Elk
20						
Patrick Creek						
Total use	Amal	68	84	45	100	0
Game only	Amal	8	20	52	380	0
Tamarack Hill	Amal	8	24	21.4	260	10
Jermayn Ranch	Amal	12	28	15.2	210	0
Tamarack Burn	Amal	21	33	9.4	60	70
Powderhouse Spring	Amal	32	32	21.2	40	0
Foracker Slope	Amal	16	14	74	300	60
Drexel Slope	Amal	4	8	34	270	50
Burnt Flats Cr.	Amal	16	46	22	20	90
9 sites		21	32	32.6	182	31
21						
Fourmile Cr.	Amal	52	4	45.4	20	80
Keystone	Prunus	20	48	23.2	40	30
Second Cr.	Amal	4	28	2.0	40	20
Deep Cr.	Amal	20	30	30.5	45	0
Micayune Gul.	Amal	0	24	14	30	10
South Nemote	Amal	0	8	6.8	40	10
Crystal Springs	Amal	0	24	3.0	50	0
Freezout	Amal	40	68	43.6	200	0
Nigger	Amal	76	72	77.8	560	0
Eddy	Amal	80	88	83.2	510	10
Ellis Cr.	Amal	20	48	36.8	130	0
Sixmile	Amal	44	60	28.2	110	10
Mill Cr.	Amal	4	24	22	20	0
Remount Past.	Amal	20	48	18.4	100	0
Butler Creek						
Upper	Amal	24	56	20	120	20
Lower	Amal	64	88	8.2	65	10
Ninemile Hill	Amal	44	64	41.6	30	0
17 sites		30	46	29.7	124	12
22						
Cold Cr.	Amal	28	44	26.2	80	140
Johnson Ranch	Amal	4	52	1.0	0	10
Dry Cr.-Dry Fk.	Amal	56	55	14.4	143	0
" " -Marble Pt.	Amal	29	42	41.2	250	60
Casey Hill	Amal	0	0	3.0	10	20
Thompson Peak Rd.	Amal	16	32	11.2	65	0
Trout Cr. Burn	Amal	20	32	50	350	30
Whiskey Gul.	Amal	0	0	16.4	60	10
Thompson Cr.	Amal	12	12	30.6	100	0
E. Trail Cr.	Amal	16	28	33	140	0
W. Trail Cr.	Amal	4	12	35.2	160	0
Clearwater Crossing	Amal	16	64	10.8	25	0
Blacktail Gul.	Amal	8	24	15.6	130	130
13 sites		16	31	22	116	31

Table 4 (continued)

District Site	Species	Percent severely hedged	Percent decadent	Percent leader use	Pellet groups /acre Deer	 Elk
23						
Helans Landing		12	20	54.8	60	0
Wig Creek		15	50	10.7	45	30
Wall Canyon		8	4	63.4	180	10
Upper Burdette Cr.		68	88	17	0	120
Mid " "		36	52	23	0	160
Lower " "		0	12	3	10	40
Lower Clark Cr.	Amal	10	50	21	60	0
Lower Camp Cr.	Amal	8	32	8.4	140	0
Blue Mtn.	Amal	0	20	11.5	0	70
Deadman Gulch	Amal	40	72	3.0	60	0
Eightmile	Amal	72	32	1.2	10	0
N. Woodchuck	Purshia	12	24	6.8	5	0
Bear Run	Amal & Purshia	24	72	59.4	184	0
Park Creek	Amal & Purshia	11	24	28	102	0
Holoman Creek	Amal & Purshia	22	26	15	400	0
Golder Road	Amal & Prunus	0	0	13	20	20
Petty Creek	Amal	4	36	27.6	70	0
W. Fk. Petty Cr.		4	12	6.8	180	20
Tank Creek	Amal	4	32	28.4	90	90
Sawmill Gulch	Amal	0	24	8.2	40	10
Deep Cr.-Gooseberry	Amal	0	0	12.6	10	0
Albert Cr.	Amal	4	16	14.2	10	40
22 sites		16	32	19.9	76	28
Clark Fork Ave. 86 sites		21	35	26	125	26

Table 5. Trend in browse condition and utilization in the Clark Fork Unit

Area	Year	No. plots	Percent severely Hedged	Condition class	Percent leader	Pellet groups per acre Deer	Elk
20	1959		59	Very poor	43	111	70
	1961	23	49	Poor	24	169	35
	1963	16	68	Very poor	37	145	22
	1965	8	77	Very poor	84	243	77
	1966	8	41	Poor	64	263	68
	1967	9	40	Poor	45	196	64
	1968	9	21	Fair	33	182	31
21	1960		32	Poor	25	96	36
	1961	9	40	Poor	19	167	0
	1963	5	32	Poor	38	131	120
	1965	18	57	Very poor	56	232	34
	1966	18	46	Poor	50	140	55
	1967	19	42	Poor	48	195	21
	1968	17	30	Fair	30	124	12
22	1959		62	Very poor	31	68	76
	1961	14	44	Poor	17	128	77
	1963	13	51	Very poor	19	89	22
	1965	13	47	Poor	39	141	134
	1966	16	31	Poor	40	98	65
	1967	16	32	Poor	34	124	45
	1968	13	16	Good	22	116	31
23	1959						
	1961	19	28	Fair	17	56	84
	1963	21	39	Poor	8	36	33
	1965	23	33	Poor	46	83	56
	1966	23	33	Poor	32	60	40
	1967	24	17	Good	31	104	55
	1968	22	16	Good	20	76	28
Clark Fork Unit							
	1959		51	V. Poor	33		
	1961	64	40	Poor	26	195	68
	1963	55	48	Poor	22	92	36
	1965	62	54	V. Poor	56	175	75
	1966	65	38	Poor	47	140	57
	1967	68	33	Poor	40	129	46
	1968	61	21	Fair	26	125	26

Table 6. Trend in browse density, Clark Fork Unit

Area Site	Year	Percent Intercept by Species: Serviceberry Chokecherry	Evergreen&Red-stem Ceanothus	Kinnikinnick & Ore. Grape	Total palat-ables	Spirea & Snowberry	Nine-bark	Other non-pal-atables	Total non-pal-atables
21									
Nigger Gul.	1959	4.38	20.98	0	25.36	0	3.1	.15	3.25
Nigger Gul.	1963	5.2	15.1	0	20.3	7.1	3.1	.15	10.35
Nigger Gul.	1967	4.38	18.6	0	22.98	15.18	22.2	.71	18.11
Eddy Creek	1957	.25	2.3	18.31	20.8	1.21	1.05	0	2.26
Eddy Creek	1963	.95	4.1	16.49	38.03	.8	.85	0	1.65
Eddy Creek	1967	.9	3.1	26.04	30.04	5.2	1.2	0	6.40
Average Area 21	1959	2.32	11.64	9.16	23.12	.61	2.08	.08	2.77
	1963	3.08	9.60	16.49	29.17	3.9	1.98	.08	5.96
	1967	2.64	10.85	13.02	26.51	10.19	1.71	.36	12.26
22									
Trail Cr.	1955	16.46	.60	9.03	26.09				
Trail Cr.	1959	29.93	1.03	17.1	48.06	.54	-	1.6	2.14
Trail Cr.	1963	28.43	1.60	22.1	52.13	0	0	1.3	1.30
Trail Cr.	1967	38.60	1.87	23.0	63.47	0	0	.5	.50
Blacktail	1955	20.85	25.45	.91	47.21	1.00	0	3.8	4.80
Blacktail	1959	33.35	25.6	.95	59.9	.75	1.35	1.25	3.35
Blacktail	1963	43.40	10.7	2.05	56.15	4.7	1.30	1.90	7.90
Blacktail	1967	44.65	13.55	.40	58.60	2.7	1.35	3.00	7.05
Clearwater Crossing	1959	27.1	0	3.05	30.15	3.5	0	1.35	4.85
	1963	33.3	0	4.75	38.05	5.6	.1	.3	6.00
	1967	29.95	0	3.45	33.40	4.85	0	1.0	5.85
Average Area 22	1959	30.13	8.88	7.03	46.03	1.6	.45	1.40	3.45
	1963	35.04	4.10	9.63	48.77	3.43	.47	1.17	5.07
	1967	37.73	5.14	8.95	51.82	2.52	.45	1.50	4.47

Table 6. (continued)

Area Site	Year	Percent Intercept by Species: Serviceberry Chokecherry	Evergreen&Red-stem Ceanothus	Kinnikinnick & Ore. Grape	Total palat-ables	Spirea & Snowberry	Nine-bark	Other non-pal-atables	Total non-pal-atables
23									
Tank Creek	1959	6.55	25.7	-	32.25	1.7	2.65	-	4.35
Tank Creek	1963	4.3	18.65		22.95	1.3	2.45	-	3.75
Tank Creek	1967	6.95	18.55		25.50	2.35	3.05	-	5.4
Petty Creek	1959	18.9	2.75		21.65	-	0	2.15	2.15
Pasture	1963	24.05	.45		24.5	2.15	0	.75	2.9
	1967	33.75	.35		34.1	2.5	0	3.0	5.3
W. Fork	1959	23.75	16.2	13.7	53.65	.5			.5
Petty Creek	1963	14.3	3.0	2.6	19.9	.85			.85
	1967	29.6	12.6	4.5	46.7	0			0
Average Area 23	1959	16.40	14.88	4.57	35.85	.73	.88	.72	2.33
	1963	14.21	7.37	.87	22.45	1.43	.82	.25	2.50
	1967	23.43	10.5	1.5	35.4	1.62	1.01	1.0	3.63
Z									
Average	1959	16.28	11.80	6.92	35.0	.98	1.14	.73	2.85
Clark Fork	1963	17.44	7.02	8.99	33.45	2.92	1.09	.50	4.51
Unit	1967	21.26	5.83	7.82	34.91	4.78	1.06	.95	6.79

Table 7. Trend in game range condition, Clark Fork Unit

Area	Site	Browse (feet intercept) 1959	1963	1967	Grass (Plant hits at foot marks) 1959	1963	1967	Forbs (Plant hits at foot marks) 1959	1963	1967
21										
	Eddy Creek	184.9	185.7	364.4	-	51	22	-	32	26
	Nigger Gulch	120.1	122.4	164.4	35	39	23	23	28	22
		305.0	308.1	528.8	35	90	45	23	60	48
22										
	Trail Creek	150.7	160.6	196.3	45	34	19	47	49	16
	Blacktail	127.1	128.1	131.3	29	29	17	24	35	31
	Clearwater Cross.	70.0	88.1	78.4	1	4	1	17	21	14
		347.8	376.8	406.0	75	67	37	88	105	61
23										
	Tank Creek	73.2	53.4	61.8	31	40	5	13	17	11
	Petty Cr. Pasture	47.6	54.8	79.2	4	10	7	3	11	14
	W. Fk. Petty Cr.	108.3	41.5	93.4	21	19	9	22	39	12
		229.1	149.7	234.4	56	69	21	38	67	37
Clark Fork Unit										
	Total	881.9	834.6 (+29%)	1169.2	166	175 (-41%)	103	149	200	146 (-27%)

Table 8. Deer and elk hunting season regulations in the Clark Fork Unit 1964-1967

Hunting Unit	Year	Deer Type	Deer Dates	Elk Type	Elk Dates
20	1964	1-ES	Oct. 18-Nov. 22	ES	Oct. 18-Nov. 24
	1965	2-ES	Oct. 24-Nov. 28	ES	Oct. 24-Nov. 28
	1966	1-ES	Oct. 23-Nov. 27	ES	Oct. 23-Nov. 27
	1967	1-ES	Oct. 22-Nov. 26	ES	Oct. 22-Nov. 19
20.1	1964	1-ES	Oct. 3-Nov. 22	ES	Oct. 3-Nov. 22
	1965	2-ES	Sept. 25-Nov. 28	ES	Sept. 25-Nov. 28
	1966	1-ES	Sept. 24-Nov. 27	ES	Sept. 24-Dec. 4
	1967	1-ES	Sept. 23-Nov. 26	ES	Sept. 23-Nov. 30
21	1964	1-ES	Oct. 18-Nov. 22	ES	Oct. 3-Nov. 22
	1965	2-ES	Oct. 24-Nov. 28	ES	Oct. 24-Nov. 28
	1966	1-ES	Oct. 23-Nov. 27	ES	Oct. 23-Nov. 27
	1967	1-ES	Oct. 22-Nov. 26	ES	Oct. 22-Nov. 19
22	1964			ES	Oct. 3-Nov. 22
	1965	2-ES	Sept. 25-Nov. 28	ES	Sept. 25-Nov. 28
	1966	1-ES	Sept. 24-Nov. 27	ES	Sept. 24-Nov. 27
	1967	1-ES	Sept. 23-Nov. 26	ES	Sept. 23-Nov. 19
23	1964	1-ES	Oct. 18-Nov. 22	ES	Oct. 18-Nov. 22
	1965	1-ES	Oct. 24-Nov. 28	ES	Oct. 24-Nov. 28
	1966	1-ES	Oct. 23-Nov. 27	ES	Oct. 23-Nov. 27
	1967	1-ES	Oct. 22-Nov. 26	ES	Oct. 22-Nov. 19

Table 9. Clark Fork Unit deer harvest from statewide questionnaire

Area Year	Deer harvested by Residents	Non-res.	Total harvest	Area sq.mi.	Kill sq.mi.	Total hunters	Deer per 100 hunters
20							
1957-58 ave.	468		468	420	1.11	557	84
1959-60 ave.	358	53	411	420	.78	551	76
1961-62 ave.	635	37	672	420	1.60	1063	63
1963-64 ave.	272	29	301	420	.72	623	48
1965-66 ave.	278	57	335	420	.80	709	47
Ten yr. ave.	402	44	446	420	1.06	700	64
1967	388	28	416	420	.99	898	46
21							
1957-58 ave.	516		516	275	1.88	636	81
1959-60 ave.	338	6	344	275	1.25	746	46
1961-62 ave.	433	15	488	275	1.62	890	50
1963-64 ave.	379	12	391	275	1.42	885	44
1965-66 ave.	440	28	468	275	1.70	822	57
Ten yr. ave.	421	15	436	275	1.59	796	55
1967	680	0	680	275	2.47	1311	52
22							
1957-58 ave.	1146		1146	610	1.88	1390	82
1959-60 ave.	887	56	943	610	1.55	1556	62
1961-62 ave.	928	73	1001	610	1.64	1793	56
1963-65 ave.	551	48	599	610	.98	1106	54
1965-66 ave.	449	83	532	610	.87	1039	51
Ten yr. ave.	792	65	857	610	1.40	1377	62
1967	765	42	806	610	1.32	1559	52
23							
1957-58 ave.	526		526	530	.99	680	77
1959-60 ave.	403	16	419	530	.79	894	47
1961-62 ave.	522	15	537	530	1.01	1041	52
1963-64 ave.	587	24	611	665	.92	1363	45
1965-66 ave.	634	31	665	665	1.00	1361	49
Ten yr. ave.	534	22	556	665	.92	1068	52
1967	843	0	843	665	1.27	1701	50
Clark Fork							
1957-58 ave.			2657	1835	1.45	3274	81
1959-60 ave.	1985	134	2119	1835	1.15	3715	57
1961-62 ave.	2516	139	2655	1835	1.45	4783	56
1963-64 ave.	1790	112	1902	1970	.97	3970	48
1965-66 ave.	1801	199	2000	1970	1.02	3931	51
Ten yr. ave.	2149	146	2295	1970	1.16	3935	58
1967	2676	70	2746	1970	1.39	5469	50

Table 10. Trend in elk hunters and harvest based on hunter questionnaire results

Area Year	Elk harvested by Residents	 Non-res.	Total harvest	Area sq. mi.	Kill sq. mi.	Number hunters total	Elk per 100 hunters
20							
1957-58 ave.	282		282	420	.67	625	45
1959-60 ave.	114	33	147	420	.35	517	28
1961-62 ave.	320	30	350	420	.83	1067	33
1963-64 ave.	199	32	231	420	.55	853	27
1965-66 ave.	351	45	396	420	.94	995	40
Ten yr. ave.	253	35	288	420	.69	811	36
1967	448	70	518	420	1.23	1565	33
21							
1957-58 ave.	89		89	275	.32	375	24
1959-60 ave.	77	0	77	275	.28	376	20
1961-62 ave.	126	4	130	275	.47	582	22
1963-64 ave.	89	1	90	275	.33	543	17
1965-66 ave.	46	0	46	275	.17	425	11
Ten yr. ave.	85	1	86	275	.31	461	19
1967	110	0	110	275	.40	769	14
22							
1957-58 ave.	586		586	610	.96	1255	47
1959-60 ave.	797	52	849	610	1.39	1985	43
1961-62 ave.	725	81	806	510	1.32	2089	38
1963-64 ave.	407	53	460	610	.75	1702	27
1965-66 ave.	318	89	407	610	.67	1485	27
Ten yr. ave.	567	69	636	610	1.04	1703	37
1967	720	125	846	610	.72	2518	34
23							
1957-58 ave.	298		298	530	.58	853	35
1959-60 ave.	227	23	250	530	.49	874	29
1961-62 ave.	316	11	327	530	.63	1199	27
1963-64 ave.	301	17	318	665	.62	1189	21
1965-66 ave.	149	40	189	665	.28	1166	16
Ten yr. ave.	258	23	281	665	.42	1116	25
1967	320	28	348	665	.52	1574	22
Clark Fork Unit							
1957-58 ave.	1255		1255	1820	.69	3181	39
1959-60 ave.	1214	107	1321	1820	.73	3752	35
1961-62 ave.	1488	126	1614	1820	.89	4937	33
1963-64 ave.	994	103	1097	1970	.56	4588	24
1965-66 ave.	864	174	1038	1970	.53	4071	25
Ten yr. ave.	1163	128	1291	1970	.65	4106	31
1967	1598	223	1822	1970	.92	6426	28

Table 11. Sex-age composition of the elk and deer harvest checked at St. Regis checking station

Species	Year	Adult males	Adult females	Young	Ratio 100 adult females/ Adult males	Young
Elk	1965	53	51	15	104	29
	1966	67	66	20	102	30
	1967	48	45	16	107	36
	Total	168	162	51	104	32
Mule deer	1965	31	29	5	107	17
	1966	28	14	3	200	21
	1967	23	10	2	230	20
	Total	82	53	10	155	19
White-tailed deer	1965	14	13	8	108	62
	1966	24	11	5	218	45
	1967	12	8	2	150	25
	Total	50	32	15	156	47

Table 12. Sex and age of elk harvested in the Clark Fork Unit based on questionnaire returns

Area	Year	Mature bulls	Spikes	Cows	Calves	Spikes:100 mature bulls	Bulls:100 cows	Calves: 100 cows
20	1960-63 ave.	94	34	96	45	36	133	47
	1964	95	36	104	23	38	126	22
	1965	53	18	65	-	34	109	-
	1966	145	53	245	42	37	81	17
	1964-66 ave.	98	36	138	22	37	97	16
	1967	183	34	226	75	19	96	33
21	1960-63 ave.	21	19	47	15	90	85	32
	1964	32	9	49	12	28	84	24
	1965	29	-	9	9	-	-	-
	1966	23	11	11	0	48	310	-
	1964-66 ave.	28	7	23	7	25	152	30
	1967	55	0	28	28	-	196	100
22	1960-63 ave.	213	75	335	123	35	86	37
	1964	142	52	173	36	37	112	21
	1965	142	27	131	47	19	129	36
	1966	165	31	176	84	19	111	48
	1964-66 ave.	150	37	160	56	25	117	35
	1967	248	69	426	89	28	74	21
23	1960-63 ave.	118	35	118	37	30	130	31
	1964	77	27	133	49	35	78	37
	1965	63	12	100	0	19	75	-
	1966	89	0	81	34	-	110	42
	1964-66 ave.	76	13	105	28	17	85	27
	1967	61	28	232	28	46	38	12
Clark Fork Unit								
	1960-63 ave.	373	174	567	194	47	96	34
	1964	346	124	459	120	36	102	26
	1965	287	57	305	56	20	113	18
	1966	422	95	513	160	23	101	31
	1964-66 ave.	351	92	426	112	26	104	26
	1967	547	131	912	220	24	74	24

Table 13. Age composition of adult elk and deer harvested in the Clark Fork Unit as indicated by dentition

Species Sex	Time	Yearlings	2½ years	Prime	Old	Total	Yearlings/ 100 older	Old/100 younger
Elk								
Male	1958-59	10	0	8*	0	18	125	0
Female	1958-59	2	0	5*	0	7	40	0
Total	1958-59	12	0	13*	0	25	92	0
Male	1960-66	28	6	39	2	75	60	3
Female	1960-66	14	8	45	6	73	24	9
Total	1960-66	42	14	84	8	148	40	6
Male	1967	12	2	6	2	22	120	9
Female	1967	2	1	5	1	9	29	13
Total	1967	14	3	11	3	31	82	11
Mule deer								
Male	1951-59	33	9	54*	14	110	43	15
Female	1951-59	17	6	36*	8	67	34	14
Total	1951-59	50	15	90*	22	177	39	14
Male	1960-66	34	18	60	14	126	37	13
Female	1960-66	14	13	21	7	55	34	15
Total	1960-66	48	31	81	21	181	36	13
Male	1967	5	1	11	1	18	38	6
Female	1967	2	2	3	0	7	40	-
Total	1967	7	3	14	1	25	39	4
White-tailed deer								
Male	1951-59	30	9	39*	14	92	48	18
Female	1951-59	22	13	37*	6	78	39	8
Total	1951-59	52	23	76*	20	170	44	13
Male	1960-66	39	16	48	11	114	52	11
Female	1960-66	22	14	21	7	64	52	12
Total	1960-66	61	30	69	18	178	52	11
Male	1967	2	2	7	1	12	20	11
Female	1967	0	0	2	1	3	-	50
Total	1967	2	2	9	2	15	15	15

*1958-59 samples included 2½ year olds as prime age

Table 14. Proportion of harvest by species based on questionnaire results

Area Year	Mule deer	White-tailed deer	Percent white-tailed deer	Elk	Elk:100 deer harvested
20					
1957-58-59 ave.	234	181	43.6	228	54.9
1960-61-62 ave.	294	318	52.0	290	47.4
1963-64-65 ave.	130	165	55.9	277	93.8
1966	160	200	55.6	505	140.2
1967	248	167	40.2	518	124.8
21					
1957-58-59 ave.	126	347	73.4	87	18.4
1960-61-62 ave.	84	296	77.9	110	28.9
1963-64-65 ave.	94	328	77.7	75	22.9
1966	90	294	76.5	45	11.7
1967	101	575	85.1	110	16.3
22					
1957-58-59 ave.	700	522	42.7	679	55.6
1960-61-62 ave.	429	347	44.7	814	104.9
1963-64-65 ave.	326	270	45.3	422	70.8
1966	160	284	63.9	467	105.1
1967	443	344	43.7	846	107.5
23					
1957-58-59 ave.	256	254	49.8	300	58.8
1960-61-62 ave.	239	222	48.2	283	61.4
1963-64-65 ave.	262	342	56.6	270	44.7
1966	303	411	57.6	204	28.5
1967	260	583	69.2	348	41.3
Clark Fork Unit					
1957-58-59 ave.	1316	1304	49.8	1294	49.4
1960-61-62 ave.	1046	1183	53.1	1497	67.2
1963-64-65 ave.	812	1105	57.6	1044	54.5
1966	713	1189	62.5	1278	67.2
1967	1052	1669	61.3	1822	70.0

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT

State of Montana

Project No. W-72-R-14

Job No. A-2

Name: Wildlife Investigations, District 2

Title: Big Game Surveys and Investigations
Deerlodge Unit Recheck

Period Covered July 1, 1968 - June 30, 1969

ABSTRACT:

Livestock use on areas also used by big game in the winter continues to be heavy (mostly privately-owned lands). Logging on National Forest lands has increased and the logging roads built have made many areas accessible by motor vehicles. Mining and smelting have been active in the unit and adverse effects on animals were noted in the Garrison and Douglas Creek areas due to chemical residues emitted. Big game license sales and recreation use in the unit are increasing. The past four winters have been normal or mild for big game in the unit.

Elk and bighorn sheep populations are indicated to be lower than in 1965 when the last recheck was made. Deer, moose, and mountain goat populations appear to be about stable in recent years. Productivity of deer and moose was higher, but elk lower, during the report period. Twenty-five percent of the 318 elk transplanted into the Unit have been reported shot; a third of the transplanted elk shot were reported killed out of the hunting district where they were released. Fluorosis was diagnosed in elk and deer from the area around the Douglas Phosphate Mill.

Improvement in condition of grassland and browse game winter ranges was found generally over the Unit. However, range condition was down at four sites where livestock use had become more intensive. Utilization of grass and browse has been generally lighter during the report period. Pellet group counts at utilization check sites were lower for elk and near the same for deer the spring of 1969, compared to the spring of 1965. The ratio of pellet groups at grassland sites was 600 elk per 100 deer and at browse sites 11 elk per 100 deer. Observations at 13 range exclosures in the Unit indicate slow improvement of range condition even with no grazing. Some complaints of damage to haystacks by elk have been received during the report period even though more haystacks have been protected by game-proof panels in recent years. Herding and baiting were used to minimize damage by elk in the upper Rock Creek area the winter of 1968-69. Combined livestock use on National Forest lands was near the same in 1968 as in 1964; with some increase in sheep use and a decrease in cattle use. More forest allotments are being fenced and put under the rest-rotation grazing system. It is hoped this will result in improved range conditions.

Elk hunting regulations have been less liberal and deer regulations about the same during the report period. Slightly less deer and about 25 percent

JAN 6 1982

more elk were reported killed during the 1965-68 period than during the 1961-64 period in the unit. More elk and deer were reported killed in 1968 than the prior ten year average. The highest harvest of elk per unit area the past twelve year period has been in hunting district 211 (.38 elk/sq. mile yearly average). The highest harvest of deer per unit area has been in hunting district 210 where an average of .63 deer/sq. mile have been reported killed yearly for the past 12 years. The proportion of bull elk harvested has been lower, but increased in hunting districts which were opened only a portion of the season for either sex elk in 1968. A small sample of elk and deer aged by dentition in 1968 indicated a high proportion of the harvest is made up of animals under three years of age (62%). The number of hunters was greater in 1968 than in other recent years. Success on mountain goats and moose was slightly lower during the report period and kill locations suggest more being taken further away from roads. An average of 61 black bear have been reported killed yearly during the 1965-68 period. More conservative either sex elk seasons, the acquisition of key big game winter ranges now in private ownership, and yearly checks on game and range status are recommended.

OBJECTIVES:

To determine the status and trend of big game populations, harvest, production, herd composition, and forage conditions in the unit in a more intensive manner than can be accomplished during the District-wide surveys.

PROCEDURE:

1. Big game winter range maps were further refined by reference to former work and aerial photos. Current information was obtained by aerial and ground surveys.

2. Range survey and trend plots were rechecked.

3. Sex and age composition counts were obtained by sample counts from the helicopter or ground.

4. Harvest trends and biological data were determined by checking stations, roving patrols, and the statewide questionnaire.

5. Losses on important wintering areas were determined by spring field reconnaissance.

6. Livestock use and competition with game on important winter ranges were determined. Ranchers were visited to obtain their thinking on big game as it concerned their ranch operation.

7. When possible, big game range surveys were made in cooperation with the Forest Service, Bureau of Land Management, or other land management agencies concerned.

A report summarizing trend data and containing recommendations for management based on current information was prepared.

FINDINGS:

HABITAT AND LAND USE TRENDS

History

The area was settled in the late 1850's when gold was discovered or reported at several locations in the area. Numerous wagon roads that led to the old mining camps still persist. These have provided access for hunters. Most of the valley and foothill lands were homesteaded from 1880 to 1910. Considerable damage to the vegetation resulted from smoke at the Anaconda smelter around the turn of the century.

Over the years mining has declined and agriculture, in the form of relatively large stock ranches, has become the primary long term industry in the area.

TREND IN CLIMATE

The climate in the area is characterized by summers with warm days and cool nights, and relatively long cold winters. Most of the unit is above 4,000 feet elevation.

Winter conditions for game tend to be relative for each area. In arriving at some standard for rating a winter for game survival, the average temperature and cumulative precipitation during the period November through March at a representative weather station had been considered. Such information for Philipsburg, which is judged to be representative for the unit, is given below for the past ten years:

Winter	Precipitation (Inches, Nov.-Mar.)	Temperature (Degrees F)	Rating for Game*
1959-60	2.27	25.3	Normal
1960-61	2.60	30.1	Mild
1961-62	3.18	24.2	Normal
1962-63	3.92	28.9	Mild
1963-64	3.26	27.0	Mild
1964-65	5.35	26.3	Severe
1965-66	2.16	28.1	Mild
1966-67	3.57	29.2	Mild
1967-68	3.87	26.2	Normal
1968-69	3.84	23.2	Normal
24 Year average	3.96	26.7	

*Severe - above average precipitation and below average temperature
Normal - above average precipitation or below average temperature
Mild - below average precipitation and above average temperature

Based on these criteria, five of the past ten winters have been mild for game, four have been normal and only one - 1964-65 - has been severe for game survival. The winter of 1968-69 started out to be severe but below average snow fall in February and March modified it to a normal rating.

VEGETATIVE COVER TRENDS

The unit is approximately 30 percent grassland, 55 percent forest, 10 percent subalpine-barren, and only 5 percent cultivated. The western hunting districts (210, 216, and 211) have considerably more forested area, and inversely the eastern hunting district (215) has the highest proportion of grassland.

There is a trend toward conifers invading grasslands in recent years. It is probable that logging is opening up at least an equal area. However, only limited clear-cut logging is being done on the winter ranges.

With the accelerated logging in recent years the trend is toward more young timber stands and less mature age stands. No large forest fires have occurred the past few years in the unit.

TREND IN LAND OWNERSHIP

The unit is about 55 percent public and 45 percent privately owned land. Some ranches have changed ownership, but have in nearly all cases continued as livestock operations. These changes in ownership could have an effect on big game, depending on the attitude of the new owners toward game.

TREND IN ECONOMY

Agriculture is the largest and most stable industry in the unit. This is mostly in the form of large beef cattle ranches. Many ranchers are stocking their lands heavier in an attempt to compensate for the price squeeze (increased cost of what they buy but about the same price for calves). This more intensive land use is probably adverse for big game.

The timber industry is growing in the Unit. Five mills are operating at present in the unit and timber is being hauled to mills up to 100 miles away. The timber harvest has been generally favorable for game by opening up blocks of land where the grazing will improve for a few years. The construction of timber haul roads has made access much easier for hunting in many areas and there is evidence that harrassment by people has in some instances caused elk to move out of some of these areas after the roads were built.

Over 20,000 acres of Forest Service lands were logged during the period 1965 to 1969 in the unit (5% on big game winter ranges). Approximately 160 miles of permanent type road was built during this time period for timber removal. The Forest Service will plan to abandon and make unusable most of the spur roads following completion of logging in the future. Thus, the trend in logging is toward more acres logged yearly, but proportionately less permanent road created.

Mining has been an important industry in the Deerlodge Unit. The Anaconda smelter at Anaconda and a chemical plant at Garrison continue to operate in spite of the fact that they are releasing smoke that is believed to have had an adverse effect on the health of animals and plant life in the area. A large

phosphate processing plant was in operation on Douglas Creek from 1964 to November 1968. Many animals, both domestic and wild, present in this area have developed fluorosis which will shorten their productive lives as a result of dust emitted by this plant.

TREND IN RECREATION

The unit is used extensively for recreation by people residing in towns in or surrounding the area. Camp ground facilities have been expanded in recent years and the trend in recreational use is reported to be increasing.

Big game license sales in Granite, Powell, and Deerlodge counties are as follows:

Year	Resident Big Game Licenses Sold		Non-resident Big Game Licenses sold
1945	2,722		68
1957	5,419		104
1963	4,467		142
	Total Deer Tag "A"	Total Elk Tags	
1966	4,352	4,102	194
1967	3,952	3,590	157
1968	5,657	4,027	288

More deer licenses were sold in 1968 than other years listed in these three counties. License sales dropped off considerably in 1967, possibly due to the Anaconda Company strike in Butte and Anaconda. Non-resident big game license sales were 33 percent higher in 1968 than 1966, the next highest year of record.

Nine licensed outfitters operated in the unit in 1968.

GAME RESOURCE TRENDS

History

Explorers and early miners reported an abundance of elk and deer in the Deerlodge area up to 1860. Mountain sheep were reported to have been common in the Rock Creek area in 1890-95 when homesteaders moved into that area. Long-time residents recall that all game became scarce about 1910. Deer became more numerous and by 1935 probably reached a peak in number. Elk increased gradually and had become common by about 1945 over most of the unit.

RECENT POPULATION TRENDS

Past investigations have been sporadic and limited in scope. Records of population size are meager. Thus, it is not possible to determine precise trends in the big game populations in the unit.

Some basis for future reference and long term trends may be provided by game observations made during past studies in the unit. Numbers of big game seen along similar routes in 1956-67, 1960-61, 1964-65 and 1968-69 are as follows:

Area	Type travel	Date	Distance	Mule deer	Elk
Dry Cottonwood	Jeep	2/56	5	65	8
	Horseback	2/61	5	7	0
	Jeep	2/65	5	16	2
	Jeep	2/69	5	8	0
Porters Corner-Wyman Ranch	Auto	3/56	27	162	5
	Auto	3/61	27	73	0
	Auto	3/65	27	53	0
	Auto	3/69	27	134	0
West Fork Buttes	Horseback	3/56	7	60	0
	Horseback	3/61	7	47	9
	Jeep	3/65	7	23	14
	Jeep	3/69	7	29	16
	Total observed		1956-57	287	13
	" "		1960-61	127	9
	" "		1964-65	92	16
	" "		1968-69	171	16

Attempts to make aerial counts of elk in the open foothill areas have been made some years in the Deerlodge unit. Weather and availability of suitable aircraft have limited aerial observations. Aerial elk counts made are given in Table 1.

Less elk were observed in hunting districts 210, 211, 212, 213, and 215 than in 1965 when the last aerial coverage was made. Near the same numbers of elk were observed in district 216 as in 1965. Less elk were observed in district 214 than the 1962-64 average (not covered in 1965).

Based on the observation of animals, sign, and range the recent trend in elk and deer is believed to be as follows:

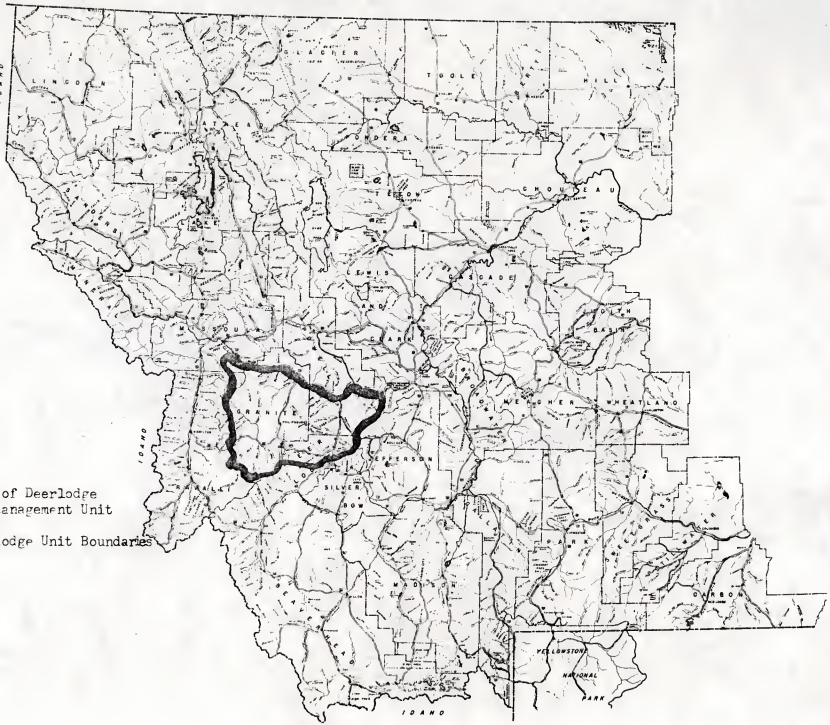

FIG. 1: Location of Deerlodge Game Management Unit

Deerlodge Unit Boundaries

Hunting district	Deer Numbers	Elk Numbers
210	Decreasing	Decreasing
211	Stable	Decreasing
212	Stable	Decreasing
213	Stable	Decreasing
214	Stable	Decreasing
215	Increasing	Decreasing
216	Stable	Decreasing

The mountain sheep population in the Rock Creek area has decreased during the past four year period. Recent counts indicate less than 20 sheep present where over 100 sheep were counted in 1965. Studies have been carried on in the area by students from the Montana Cooperative Wildlife Research Unit and a final report is being prepared.

Mountain goat numbers are believed to be near stable based on limited observations and hunter success. Slightly less goats were observed in the Pintlars, but more goats were seen along the Rock Creek-Bitterroot Divide during routine field trips in 1968 compared to similar trips in 1965.

Aerial coverage of the stream courses west of Flint Creek in 1967 resulted in a count of 48 moose. Only 26 moose were observed in a similar coverage in 1969. (Note Table 2). This would suggest a decline in the past twelve year period. Ranchers in this area report seeing less moose the past few years on their ranches. However, hunter success on moose has remained good and some people have noted more moose in the "back" country areas. It may be that the "road-side" moose population has tended to be harvested while the individuals frequenting the back country have been less heavily harvested.

Herd Composition and Productivity

Age of mule deer classified in the Deerlodge Unit the past four years is given in Table 3. Age of deer classified by periods is given below to show trend:

Year period	Fawns/100 adults
1957-61 Ave.	44
1962-65 Ave.	48
1966-69 Ave.	54

These data suggest that productivity and/or survival of fawns has improved the past twelve year period in the Deerlodge Unit. Mule deer population condition would rate good in hunting district 210, 213, and 214; fair in hunting districts 211, 215, and 216; and poor in hunting district 212

based on age ratio of classified deer.

Only 51 white-tailed deer were classified in 1969 and a ratio of 63 fawns per 100 adults noted. This would suggest that the sparse white-tailed deer population is in good productive condition.

Sex and age of elk classified in the Deerlodge Unit the past four years are given in Table 4. The proportion of calves observed and reported killed by time periods is given below to show trend:

Year Period	Winter Field Check Calves/100 Cows	Hunter Harvest Calves/100 Cows
1957-61 Ave.	50	46
1962-65 Ave.	51	39
1966-69 Ave.	38	40

The data suggests that productivity of elk in the unit is dropping. Population condition based on productivity would rate fair in the unit. Limited samples suggest good productivity of elk in hunting districts 211 and 216.

Fifteen mountain goats were classified in hunting district 261 with a ratio of 27 kids per 100 adults.

Twenty-nine moose were classified during the winter aerial coverage - 18 adults and 11 calves - indicating a ratio of 61 calves per 100 adults.

TREND IN DISTRIBUTION

Elk, mule deer, and moose are still present over nearly the whole Deerlodge Unit. White-tailed deer are still present in the lower drainages of the unit. The few mountain sheep remaining are restricted to a portion of the upper Rock Creek area. Mountain goats have expanded their range into the area east of Rock Creek.

Movements and Migrations

Positive information regarding movements and migrations of big game in the Deerlodge Unit is limited. Some tagged elk (from Yellowstone Park) have been released in the Unit. A summary of tag return information is given

below:

Release site Date of release Number of elk	General area where reported killed	Number reported killed to date
Rock Creek at mouth of Cougar Creek March 1952 45 elk	Cougar Creek	2
	West Fork Rock Cr.	4
	Trout Creek	1
	Upper Willow Creek	1
	Burnt Fork Bitterroot	3
	Madison River	1
	Beaverhead Area 32	3
		15
Mill Creek February 1952 34 elk	Beaverhead Area 32	3
Gold Creek January 1951 20 elk	Flint Range Area 212	3
Peterson Creek December 1950 20 elk	Dog Creek Area 215	1
	Boulder River Area 318	1
		2
Olson Gulch 1959-60-62-64 142 elk	S. Flint Range Area 213	15
	N. Flint Range Area 212	8
	Beaverhead Area 32	8
	Nelson-Storm Lake Area 214	5
	Beaverhead Area 319	1
		37
State Prison Farm February 1963 29 elk	No. Flint Range Area 212	9
Garrity Mtn. March 1967 28 elk	Nelson-Barker Area 214	2
	Beaverhead Area 319	5
	(Trapped Fleecer Game Range 1969)	1
		7

A majority of the transplanted elk have been shot in the area where they had been released. However, considerable drift of these elk to other hunting units did occur.

Several tagged Yellowstone elk released near Walkerville (hunting district 318) were reported shot in District 215. A cow elk neck-banded on the Bitterroot Stock Farm east of Hamilton was observed on the Little Hogback ridge east of Rock Creek the following winter.

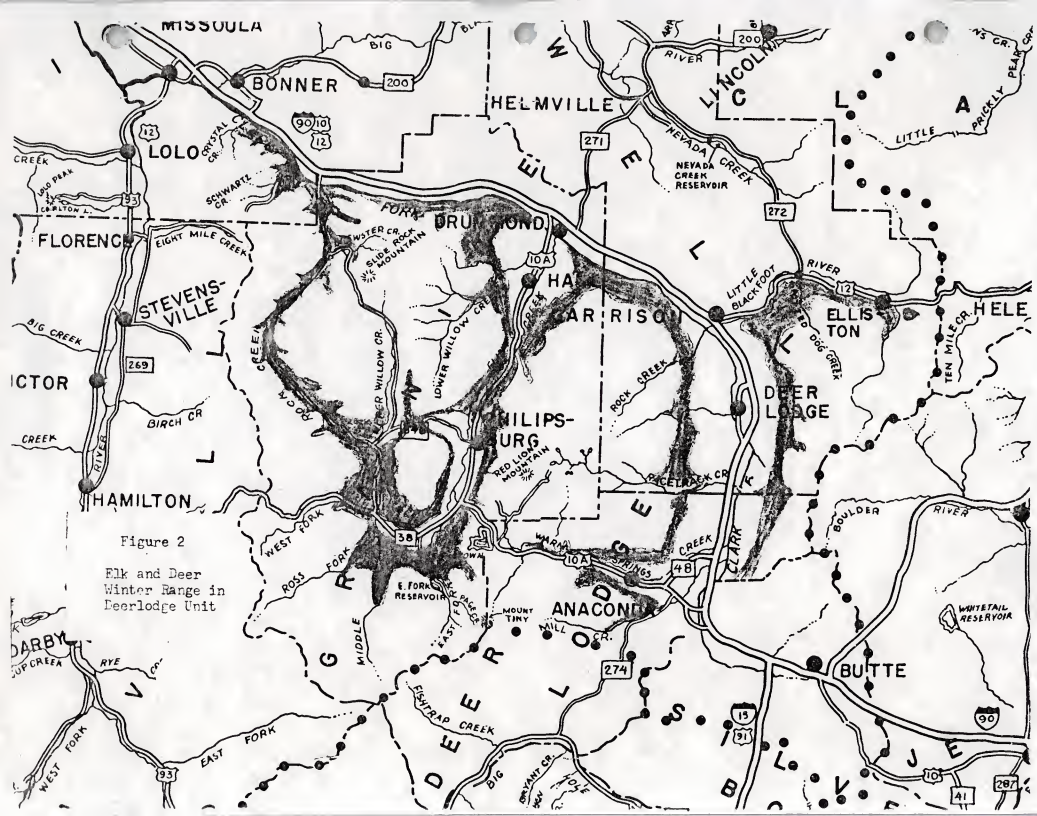

Figure 2

Elk and Deer Winter Range in Deerlodge Unit

To date 76 (25%) of the 318 elk transplanted from Yellowstone Park have been reported killed by hunters.

Population Losses Other Than Hunting

There are constant losses to animal populations due to old age, starvation, disease, accidents, predators, and poaching. Generally such losses are lower in populations that are properly harvested by legal hunting.

Seventeen deer carcasses were found the spring of 1969. Most of these were mule deer fawns in the upper Rock Creek area. Bone marrow condition indicated malnutrition was present in most cases.

The extent of losses due to disease is not well known. Most animals checked in the fall appear to be in prime condition.

Elk and deer in the Douglas-Dunkleberg-Gird Creek areas showed evidence of flourosis apparently from consuming dust covered forage in the vicinity of the Douglas Phosphate Mill. It is not known if actual losses occurred due to this contamination of the forage.

Coyotes and bears are controlled at the request of livestock ranchers over most of the unit. Predator numbers appear to be stable at a relatively low level.

BIG GAME FORAGE TRENDS

History

The grasslands of the unit generally have been damaged by overuse during the past 100 years. Large numbers of sheep, cattle, horses, elk, and deer have at various times damaged at least portions of the range by over-use. Ploughing of range lands and chemical damage from the smelters have hurt some areas.

Approximately two-thirds of the winter ranges are privately owned lands. Over 80 percent of the winter range in hunting districts 213 and 215 is privately owned lands. The proportion of private lands used as big game winter range is higher in the Deerlodge Unit than other management units in District Two. Locations of winter ranges are shown in Figure 2.

The primary vegetative type used by elk and deer in the winter in the Deerlodge unit is grassland. Most of the key wintering sites are south or west exposed slopes where sun and wind action tend to reduce snow depth.

TREND IN RANGE CONDITION

Range condition surveys have been limited in the past. Most transect and study sites to determine condition and trend have been established during the past ten years.

Twelve sites in the Flint Range were surveyed for range status in 1957 and rechecked in 1960, 1964, and 1968. Transects have been established at five other grassland sites since. Findings at these grassland sites are given in Table 5.

Range condition at 13 (77%) of these sites improved or remained the same from 1964 to 1968. At the same time, the range trend was down at 4 (23%) of the sites. An immediate past history of increased livestock use appeared to be the cause of the downtrend in condition at these sites.

A half-acre game-livestock exclosure was built on Modesty Ridge in 1960 by cooperative effort of the Anaconda Company and the Montana Fish and Game Department. Line intercept range condition transects were established inside the exclosure and just outside in the grazed area. These transects were rechecked in 1964 and 1968. Results are given in Table 6.

The exclosed area tended to improve by a 13% increase in density of desirable plants, a 10% decrease in undesirable plants, and an 18% decrease in non-vegetation. The outside grazed area remained near stable from 1964 to 1968 with relatively heavy use by cattle and horses each year. Use by big game has been very light at this site in recent years.

Grass utilization plots have been checked at nineteen sites in the unit by the Forest Service and Fish and Game Department the past few years. A summary of results is given in Table 7.

Utilization was below 50 percent at all four sites checked in Area 210 the spring of 1969.

Over 50 percent of the rough fescue was used at the three sites checked in Hunting District 211.

Relatively heavy use of rough fescue has occurred on the State Prison Farm check sites - South America Park, Taylor Ridge, and Robinson Ridge. Use checks made in the fall suggest that most of this use has been by cattle the past several years.

Cattle and horse use has been heavier in the Modesty Creek area the past three years. Pellet group counts have indicated light elk use.

Use of the grassland area reserved for game on Orofino Mountain in hunting district 215 was found to be light.

Forage at two of the six sites checked in hunting district 216 were used over 50 percent the past several winters.

Average utilization of bunchgrass was 20 percent lighter during the winter of 1968-69 than during the winter of 1967-68 at the sites checked.

Based on pellet group counts approximately six elk per deer used the grassland sites during the 1968-69 winter which was also true during the 1964-65 winter.

Palatable browse has been checked at key sites since 1956. Results since 1965 are given in Table 8.

The condition of palatable browse at the sites checked has shown an improving trend over the Unit and by 1969 averages fair condition. However, the limited browse supply in hunting districts 211, 212, 214, and 215 has remained in poor or very poor condition.

Utilization of browse was greater in 1967 (55%) of the past four year period.

More deer pellet groups were counted at these browse sites in 1965 than since that date. The highest elk pellet group count was made in 1967 at these check sites. A ratio of 11 elk per 100 deer pellet groups was noted at these browse transects the past five years.

Pyramidal shaped agronomy cages were built from 1960 to 1965 to provide an exclosed sample of range on winter game use areas. Most cages were roughly 16 by 16 feet at the base. The location of agronomy cages and observations is given below:

Location	Observations
Area 210	
Spring Creek Ridge	Constructed the fall of 1960. The chokecherry and grass plants are taller and more vigorous inside than those outside; suggesting that grazing is retarding improvement at this site.
Spring Creek Bald Hill	Constructed the fall of 1960. Vigor and density of rough fescue plants was better inside by the spring of 1963. Seedling chokecherry plants are not bigger inside than out; suggesting that grass may be climax vegetation at site.
East Hill-Upper Spring Creek	Constructed summer of 1964. Observation in May 1969 showed more weedy vegetation inside than outside. Possibly used heavily by rodents.
Golden Mountain	Constructed in 1961. Slightly better ground cover inside. Recovery very slow at this site. Much pocket gopher damage both inside and out.

Location	Observations
East Fork Brewster Bald Hill	Constructed in 1961. Better forage density inside. Light game use.
North Fork Brewster Ridge	Constructed in 1961. Periodic observations suggest moderate use by both livestock and game at site.
Strawberry Mountain	Constructed in 1961. Density and vigor of palatable grass better inside than out by fall of 1968. Area used heavy in late spring by game.
Hogback Ridge	Constructed summer 1961. Density of grass better inside by summer of 1968.
Sheep-Windlass Ridge (Three cages)	Constructed summer 1960. Periodic inspections have shown recovery of sites. Slightly better density and vigor of desirable grass inside. Young conifers vigorous both in and out; suggesting game use on conifers not excessive past few years.
Mill Gulch (Two cages)	Constructed summer 1960. Periodic observations have shown more improvement in density and vigor of desirable grasses inside cage than outside.
Area 212	
Boulder Creek	Constructed summer 1960. Mountain mahogany and chokecherry plants inside gradually becoming more vigorous. Mountain mahogany and chokecherry plants outside all severely hedged and decadent.
Area 213	
Olson Gulch	Constructed summer 1960. Slight improvement noted in browse and grass protected as compared to outside.
Area 215	
Dry Cottonwood Creek	Constructed summer 1960. Bitterbrush and serviceberry protected has become more vigorous. These species outside have remained in severely hedged condition.

LAND USE PROBLEMS

Competition between big game and livestock occurs on some areas. Most of these conflict areas are big game winter ranges which are also used by livestock.

Approximately 65 percent of the elk and deer winter on privately owned lands. Consequently, the number of elk and deer that can be maintained in the Deerlodge Unit depends, to a high degree, on how much game use the private land owners will tolerate and how heavily they graze these lands with livestock. Most such lands are grazed fully before the cows are taken off in the fall.

Complaints of big game damage on private lands have been received from some sub-units during the past four year period. Recent landowner complaints of game damage are as follows:

Hunting Unit Location	Year	Species	Nature of Damage
Area 210			
Upper Rock Creek	1967-69	Elk	Haystacks eaten, trampled and stack fences torn down
Mouth Harvey Creek	1964-1969	Elk	Haystacks eaten and trampled
Area 214			
Trout Creek	1961-69	Elk	Haystacks eaten and trampled
Area 215			
Lower Little Blackfoot	1969	Mule deer	Haystacks eaten and trampled

There have been about the same number of complaints the past four year as there were the prior four year period.

Livestock use on National Forest lands in the Deerlodge Unit, 1956, 1964 and 1968 is given below:

	1956		1964		1969	
Area	Cow Months	Sheep Months	Cow Months	Sheep Months	Cow Months	Sheep Months
Rock Creek, W. Flint Creek	10,615	0	10,482	0	8,822	0
Flint Range	4,380	2,450	4,548	0	4,598	0
E. Deerlodge, L. Blackfoot	5,266	6,840	5,520	2,700	4,748	3,967
Deerlodge Unit	20,261	9,290	20,550	2,700	18,168	3,967

Several reductions and one permit under non-use resulted in a reduction of 12 percent in cattle-horse use in 1968 compared to 1964. Sheep use was up in 1968. Many allotments have been cross fenced to make rest-rotation grazing possible. Key game winter range sites have been fenced off and the forage reserved for game in some areas. Some cattle have been moved to new ranges created following clear-cut logging. Some increase in cattle numbers on the National Forest have been granted for 1969 where range conditions are improving or additional range is available following logging.

ADJUSTMENTS IN LAND USE

It appears that generally the timber harvest has been and will continue to be beneficial to big game. The temporary openings created should provide added forage for both game and livestock. Where clear cuts are made on south and west slopes in the game winter range zone it would seem wise not to plant conifers to prolong the period of greater ground forage density. Small block cutting would be more beneficial to big game than large block cuts by providing a maximum of feeding and hiding areas in close proximity - the edge effect. More cutting in the winter range zone would be beneficial to big game.

The available forage supply in the winter range zone is the primary key to the number of big game animals it is possible to carry in an area. On many of these winter range areas, the combined use of big game and live-stock is too great and, as a result, at least portions are in poor condition. A possible adjustment that would favor big game in such areas would be reservation of forage for game use in the winter and spring. Where these key lands are privately owned, it would seem wise to investigate the possibility of acquisition of grazing rights by land purchase or lease. Where such lands are in public ownership, the administering agency should be requested to reserve some of the forage for game use.

Game range aquisition and maintenance will logically be costly and have to be limited in extent.

The Forest Service have on most districts prepared a Wildlife Habitat Management Plan. These plans express the policy of managing lands best suited for wildlife in the best interest of wildlife. This should result in gradual land use adjustments to favor big game.

There appears to be no easy solution to the range problem. Taking more livestock off the Forest ranges could cause greater use on private lands at lower elevations which are even more important to game. There are also ranchers who state that as long as they can use public lands for livestock they will tolerate moderate game use on their lands.

Another complicating factor in the management of the Forest ranges is that some unfenced private and leased lands are pooled for grazing. If the permittees who own or lease such lands believe they are not being allowed to graze the range adequately they could fence these lands. Under fenced pasture conditions they could accomplish complete forage use by livestock, leaving virtually nothing for game. Thus, there appears to be no universal or easy solution to the range problems in the Deerlodge Unit.

GAME MANAGEMENT

HISTORY

Hunting regulations were put into effect in 1872 and were gradually made less liberal until the season on elk was closed in 1913 and a one buck limit was put into effect on deer in 1921. Buck deer seasons, and bull elk season in portions of the unit only, prevailed until 1952 when a portion was opened to either sex deer. Seasons generally became more liberal during the 1950's with more either sex elk seasons and portions open to the taking of two deer of either sex.

TREND IN HUNTING REGULATIONS

Summaries of recent elk and deer regulations are given in Tables 9 and 10. Elk seasons have tended to be slightly less liberal the past four years. The last year of a two-deer bag limit in any areas of the Deerlodge Unit was 1962. Seasons have not been extended past the normal closing dates since 1962. Hunting districts are shown in Figure 3.

TREND IN THE ELK AND DEER HARVEST

Information concerning the big game harvest has been gained by hunter questionnaires, checking stations, and field patrol.

Calculated harvest based on the statewide questionnaire is given in Tables 11 and 12. These returns indicate:

1. Nine percent less deer but 24 percent more elk were taken the past four years (1965-68) than the four years prior (1961-64) in the unit.

2. Twenty four percent more deer and 47 percent more elk were taken in 1968 than prior average (1957-67) in the unit.

3. Since 1957 when the questionnaire was standardized the highest elk harvest occurred in 1968 and the highest deer harvest occurred in 1957 in the unit.

4. The highest number of elk harvested per square mile the past four years was .45 in hunting district 211. The highest harvest of elk per unit area the past twelve years has been in hunting district 211 (.38 elk/sq. mi. average).

5. The highest number of deer harvested per square mile the past four years was .68 in hunting district 214. The highest average deer harvest per unit area has been in hunting district 210 with an average yearly harvest of .63 deer/square mile.

White-tailed deer occur in significant numbers only in areas 210 and 212.

The proportion of white-tailed to mule deer in these areas is summarized below:

H.D. 210	1957-60 Ave. -	21% white-tailed
	1961-64 Ave. -	17% white-tailed
	1965-68 Ave. -	16% white-tailed
H.D. 212	1957-60 Ave. -	19% white-tailed
	1961-64 Ave. -	16% white-tailed
	1965-68 Ave. -	17% white-tailed

Approximately the same proportion of white-tailed and mule deer have been taken the past four year period (1965-1968) as the prior period (1961-64).

Sex and age of elk and deer reported harvested by the state-wide questionnaire returns are given in Table 13.

The proportion of buck deer has been greater the past four years. The proportion of bull elk, however, has been slightly lower the past four years compared with a prior period. A significantly higher proportion of bulls was taken in hunting districts 210, 212, and 215 than other hunting districts in the unit (a possible reflection of shorter either sex followed by antlered bull seasons in these hunting districts.

A lower proportion of calf elk were reported shot the past four year period. The proportion of calves reported shot was especially low in 1965.

Checking stations were operated a few random weekend days on roads leaving the Rock Creek area. Results were as follows:

Location	No. days operated	No. elk checked	No. deer checked	Hunters checked
Skalkaho road	4	12	16	486
Philipsburg-Rock Cr. road	3	6	6	248
Lower Rock Creek	3	1	3	154
Welcome Mtn. Rd.	1	1	3	76
		20	28	964

Of the elk checked 10 were bulls, 9 were cows, and 1 was a calf. Of the mule deer checked 16 were bucks, 9 were does, and 3 were fawns.

Some of these animals were aged by dentition. Results are given below:

	1½	1½	2½	Prime	Old
Elk					
Bulls	0	3	0	1	0
Cows	1	0	2	2	1
Mule deer					
Bucks	1	7	2	6	0
Does	2	3	2	4	0

This small sample suggests that a relatively high proportion of the harvest is made up of animals under three years of age.

Trend in Hunting Pressure

The numbers of deer and elk hunters using the Deerlodge Unit based on questionnaire returns are given in Tables 11 and 12.

The numbers of elk hunters using the Deerlodge Unit was less the past four year period than prior periods. However, more elk hunters used hunting districts 210, 211, and 214 than the prior four year period. More elk hunters used the Deerlodge Unit in 1968 than any of the prior three years (1965-67).

The number of deer hunters using the Deerlodge Unit was slightly less the past four years (1965-68) than the prior four year period (1961-64). However, the number of deer hunters was indicated to be greater in hunting districts 210, 212, 213, 214, and 215 in 1968.

The trend in non-residents hunting in the Deerlodge Unit based on questionnaire returns is given below:

Year	Percent of total elk hunters	Percent of total deer hunters
1959-64 Ave.	5.3	4.5
1965	5.2	5.3
1966	9.5	6.6
1967	3.6	3.2
1968	5.6	3.2
1965-68 Ave.	6.0	4.4

The proportion of non-residents hunting elk in the Deerlodge Unit has increased slightly, while the proportion of non-residents hunting deer has remained near the same the past two years.

Trend in Moose, Goat, Sheep, Bear and Antelope Harvest

A summary of mountain goat permits issued and harvest is given in Table 14. Success was lower the past five years compared to the prior eight year period in hunting districts 212 and 213. Success was slightly higher in hunting district 222. Success has been very good in hunting district 216 where permits have been granted only the past five years.

A tabulation of location of goat kills is given in Table 15. The Mt. Powell area has been the kill site of most of the goats reported takn in hunting district 212.

The Twin Lakes-Mt. Howe area has been the reported kill site of most of the goats reported taken in hunting district 222 the past four years. The harvest results suggest that some of the more accessible sites, like Goat Flats, have not been as good goat hunting spots as 10-12 years ago when permit hunting was started in this area. The kill sites now are more remote places.

A summary of moose permits issued and harvest is given in Table 16. The special season hunting districts have been consolidated in some cases resulting in more permits in some districts but elimination of several districts. Success has averaged over 70 percent in all districts the past five years. However, success has been slightly lower the past five years than the prior 7-8 year period.

The proportion of bull moose taken has been greater the past five years (55%) than the prior 7-8 year period (48%). This is a desirable trend and may indicate more selectivity on the part of the hunter toward shooting a bull.

A summary of reported location of moose kills is given in Table 17. Many hunters generalize as to a major drainage as kill site so that location of kill must be considered on the general area basis.

A summary of bighorn sheep permits and kill the past four years is given below:

Year	No. permits	Sex	Sheep killed
1965	5	3/4 curl rams	3
1966	5	E.S.	4
1967	5	E.S.	1
1968	0		

No sheep permits were granted after it was discovered that the sheep population was declining.

A summary of antelope permits and harvest is shown below for the past four years:

Year	No. permits	Sex	Number killed
1965-67	0		
1968	15	Either	14

The small antelope population near Deerlodge has provided limited antelope hunting. No permits were issued from 1964 to 1967 as less antelope were observed. There has been some rancher complaint of damage to hay the past several years, so permits were allowed in 1968 again.

A summary of black bear harvest in the Deerlodge Unit based on questionnaire returns is given below:

	Bear hunters	Bears killed
1960-64 Ave.	714	35
1965	143	30
1966	305	65
1967	335	94
1968	231	55
1965-68 Ave.	254	61

This information indicates more bear taken yearly the past four years compared to the prior five year period.

Adjustments in Game Management

Restocking: No lack of foundation stock of big game is known in the Unit. It may be necessary to restock bighorn sheep in the Rock Creek area, where the population has become very low, if the present downward trend continues.

Closures and Preserves: None needed.

Predator Control: The predators in the Deerlodge Unit are subject to control by livestock growers, hunters with hounds, and others. In view of the complex relationships recognized between predators and the long range welfare of prey species, no predator control to benefit wildlife is recommended.

Artificial Feeding: Feeding big game is not believed to be wise except in an emergency situation. Elk have been observed to become addicted to artificial feed following emergency programs and tend to pass through good range forage in search of hay the following year.

Game Salting: The need for salt for game is not well known. Salt put out for

livestock is used by game, but it is believed they can live without it and its value to affect distribution is limited.

Hunting Regulations: In light of lower trend counts of elk it would seem wise to adjust hunting regulations to provide for a lower harvest of elk generally over the Deerlodge Unit. Logging roads have made new areas accessible by motor vehicles each year. This tends to accelerate the rate of kill and it is probable that an adequate harvest of elk can be made with a shorter season.

It is probable that a maximum harvest of elk can be made if the proportion of cows in the wintering population is kept high and the proportion of bulls low. The number of cows present each winter will determine the amount of increase the next year far more than the carry-over of bulls which have performed their purpose in the reproductive cycle, usually before the hunting season ends. Thus a relatively short either sex season followed with an antlered bull season is suggested.

Complaints of damage to haystacks by elk have been received periodically from some ranches for many years. Based on the premise that many of the elk involved are addicted to hay and could survive if they would stay on the range lands at higher elevations, it is suggested that special seasons restricted to the "trouble spots" be held to harvest the animals actually doing the damage and spare the animals that stay back on natural winter range. These special seasons should start at the end of the regular season and continue to near February 15.

Recommendations

It is recommended that:

1. Browse transects, grass utilization and condition transects be checked each year to determine the trend in range utilization and condition.

2. Composition of the elk and deer herds be checked annually to determine productivity of the big game herds.

3. The U. S. Forest Service and Bureau of Land Management be requested to reserve more forage on key game winter ranges if possible and practical.

4. The possibilities for acquiring certain important game winter range areas in upper Rock Creek that are now in private ownership be further investigated and these range lands be acquired when possible.

5. Special permits for moose be continued at near the same number in hunting districts 210, 212, and 214;but be reduced somewhat in hunting district 211.

6. Special permits for mountain goats be continued at near the same numbers in the Unit.

7. Special permits for mountain sheep be discontinued in the Unit until sheep numbers increase.

8. Special permits for antelope be continued in the Deerlodge area at near

the same number as in 1969.

9. Deer hunting seasons continue about as in 1968 with extensions to be put into effect locally if damage complaints due to deer develop any place in the Unit or browse utilization becomes excessive.

10. Hunting regulations for elk be generally more conservative. Suggested trial elk season by hunting districts are as follows:

H.D. 210 — Regular season opening date (third Sunday in October)
Either sex first eight days only
Antlered bulls through last Sunday in November

H.D. 211 — Regular season opening date (third Sunday in October)
Either sex through last Sunday in November
Antlered bulls through December 31st in portion east of Middle Fork Rock Creek road

H.D. 212 — Regular season opening date (third Sunday in October)
Either sex first eight days only
Antlered bulls through last Sunday in November

H.D. 213 — Regular season opening date (third Sunday in October)
Either sex opening day only
Antlered bulls through last Sunday in November

H.D. 214 — Regular season opening date (third Sunday in October)
Either sex first eight days only in portion east of Storm Lake road
Either sex through last Sunday in November in portion west of Storm Lake road
Antlered bulls through December 31st in portion west of Storm Lake road

H.D. 215 — Regular season opening date (third Sunday in October)
Either sex opening day only
Antlered bulls through last Sunday in November

H.D. 216 — Regular season opening date (third Sunday in October)
Either sex first eight days only
Antlered bulls through last Sunday in November
Portion comprising Norman Bohrenson Ranch either sex from last Sunday in November through February 15th of next year

Prepared by: Fred L. Hartkorn — Approved by: Wynn G. Freeman

Date: July 31, 1969

Table 1. Aerial elk counts, Deerlodge Unit

Location	1965	1969	Trend
H.D. 210			
Tyler Cr. to Brewster Creek	69	52	
Tyler Cr. to Smart Creek	48	23	
Smart Cr. to Marshall Creek	23	2	
Marshall Cr. - Skalkaho Road	5	21	
Total H.D. 210	145	98	-32%
H.D. 216			
Brewster Creek to Hogback Creek	37	38	
Hogback Creek to Upper Willow	3	29	
West of Rock Creek	83	57	
Total H.D. 216	123	124	+1%
H.D. 211			
West Fork to Ross Fork	0	13	
Ross Fork to Middle Fork	60	42	
Middle Fork to East Fork	70	54	
Total H.D. 211	130	109	-16%
H.D. 212			
Boulder Cr. to Rock Creek	108	91	
Rock Creek to Racetrack Creek	189	78	
Red Lion Creek to Boulder Creek	50	43	
Total H.D. 212	347	212	-39%
H.D. 213			
Racetrack Creek to Lost Creek	4	9	
Lost Creek to Red Lion Creek	41	10	
Total H.D. 213	45	19	-58%
H.D. 214			
Mill Creek to Barker Creek	-	5	
Barker Creek to Georgetown	-	37	
Georgetown to East Fork	27	29	
Total H.D. 214	27	71	
H.D. 215			
Girard Gulch to Dry Cottonwood	26	6	
Dry Cottonwood to Peterson Creek	68	42	
Peterson Creek to Freezeout Gulch	96	20	
Freezeout to Little Blackfoot	147	84	
Little Blackfoot to McDonald Pass	19	10	
Total H.D. 215	356	162	-54%

Table 2. Aerial moose counts in hunting district 210 and 211 in 1957 and 1969

Area	1957	1969
210		
Rock Creek (mouth to W. Fk. Bridge)	9	6
Upper Willow Creek	4	4
Lower Willow Creek	6	2
Harvey Creek	2	0
	21	12
211		
West Fork Rock Creek	8	5
Ross Fork Rock Creek	9	3
Middle Fork Rock Creek	6	4
East Fork - Meadow Creeks	4	2
	27	14

Table 3. Sex and age of mule deer observed in the Deerlodge Unit

Hunting district	Year	Total adults	Fawns	Fawns/ adults
210	1966	77	40	52
	1967	182	110	60
	1968	31	13	42
	1969	158	109	69
	1966-69 total	448	272	61
216				
	(Portion of area 210 in 1966-67)			
	1968	101	56	55
	1969	138	69	50
		239	125	52
211	1969	42	22	52
212	1967	13	6	46
	1969	63	19	30
	1967-69 total	76	25	33
213	1968	14	12	86
	1969	11	5	45
	1968-69 total	25	17	68
214	1967	21	14	67
	1969	8	5	63
		29	19	65
215	1967	34	16	47
	1969	85	39	46
	1967-69 total	119	55	46
Deerlodge Unit				
	1966	77	40	52
	1967	250	146	58
	1968	146	81	55
	1969	505	263	52
	1966-69 total	978	530	54

Table 4. Sex and age of elk observed in the Deerlodge Unit

Hunting District	Year	Adult bulls	Spike bulls	Cows	Calves	Bulls/ 100 cows	Spikes/100 older bulls	Calves/ 100 cows
210								
	1966	20	4	43	13	56	20	30
	1967	9	0	7	5	-	-	
	1968	6	1	21	8	-	-	57
	1969	12	5	58	22	29	42	38
1966-69	total	47	10	129	48	44	21	37
211								
	1968	6	0	11	4	-	-	36
	1969	7	5	22	10	55	71	45
1968-69	total	13	5	33	14	55	38	42
212								
	1967	1	2	15	7			47
	1968	0	1	6	3			50
	1969	6	2	51	15	16	33	29
1967-69	total	7	5	72	25	17	71	35
215								
	1969	13	10	97	32	24	77	33
216								
	1969	7	5	27	16	44	71	59
Deerlodge Unit								
	1966	20	4	43	13	56	20	30
	1967	10	2	22	12	55	-	55
	1968	12	2	38	15	37	-	40
	1969	45	27	255	95	28	60	37
1966-69	total	87	35	358	135	34	40	38

Table 5. Trend in bunchgrass condition in the Deerlodge Unit

Hunting area	Site	Grass species	1964 % altered plants	1964 Ave. leaf height	1968 % altered plants	1968 Ave. leaf height	Trend
210	Babcock Mtn.	Agsp	90	11.8	45	10.7	up
		Feid	58	4.3	27	4.5	up
	East Hill	Agsp	33	12.3	24	12.4	up
		Fesc	95	7.6	55	11.4	up
		Feid	18	4.2	7	5.5	up
216	Hogback Ridge	Agsp	50	10.6	20	10.8	up
		Fesc	91	9.4	92	6.3	stable
		Feid	70	4.8	8	3.6	up
211	Upper Lone Pine Ridge	Fesc	87		83		
	Lower Lone Pine Ridge	Fesc	90		82		up
212	Douglas Mtn.	Agsp	34	14.0	16	12.9	up
		Fesc	18	11.2	10	11.4	up
	Dingwall Pasture	Fesc	38	12.5	88	10.2	down
		Agsp	0	14.5	10	14.1	down
	Elk Ridge	Fesc	78	9.2	60	7.86	up
	Powell Ridge	Agsp	36	11.5	14	12.1	up
	So. American Park	Fesc	85	6.23	67	6.27	up
		Feid			14	3.40	
		Agsp			8	10.33	
	Taylor Ridge	Feid	54	4.10	19	4.30	up
		Agsp			37		
	Robinson Ridge	Fesc	73	9.1	77	6.25	down
		Feid			31	3.06	
		Agsp			0	11.0	
	Dempsey Ridge	Agsp	36	8.0	24	9.3	up
		Feid	36	2.6	26	2.8	up
	Racetrack Ridge	Agsp	4	15.9	6	15.6	stable
		Feid	8	6.0	2	6.6	up
213	Modesty Ridge	Fesc	38	12.37	56	9.5	down
	Stuckey Ridge	Agsp	12	14.8	22	14.4	down
		Feid	16	5.4	34	4.82	down
	East BLM	Agsp	28	8.9	15	11.2	up
		Fesc	14	14.5	18	13.9	stable

Table 6. Line intercept transect results at Modesty Ridge exclosure site

	Inside exclosure			Change	Outside exclosure			Change
	1960 hits	1964 hits	1968 hits	1964 to 1968	1960 hits	1964 hits	1968 hits	1964 to 1968
Rough Fescue	21	41	54		17	41	32	
Idaho Fescue	3	9	6		3	15	8	
Wheatgrass	5	12	8		9	15	6	
Junegrass	5	8	10		0	6	6	
Blue grass	1	4	16		5	3	20	
Sedge	36	29	24		19	15	22	
Total Grass-Sedge	71	103	118	+13%	53	95	94	-1%
Fringe Sage	15	12	10		29	18	4	
Vetch	3	8	8		8	10	8	
Achillea	2	1	4		1	2	1	
Anteneria	0	0	0		3	1	2	
Fleabane Daisy	0	1	0		4	2	8	
Sulphur Eriogonum	0	3	4		1	3	14	
Unknown forb	0	4	0		1	0	0	
Total forbs	20	29	26	-10%	47	36	37	+3%
Litter & Moss	93	55	38		96	62	53	
Rock-Bare	16	13	18		4	7	16	
Total Non-veg.	109	68	56	-18%	100	69	69	no

Table 7. Grass utilization in the Deerlodge Unit, spring checks 1968 and 1969

Hunting district Site Year	Species checked	Percent utilization (by grazed plant count)	Pellet groups/acre Elk	 Deer
210				
East Hill				
1968	Fesc	30	100	80
1969	Fesc	18	40	0
Spring Creek Face				
1969	Fesc	15	250	50
Spring Creek Ridge				
1969	Nearest bunchgrass	45	270	60
Babcock Mtn				
1968	Agsp	35	120	80
211				
Potato Lakes				
1968	Fesc	65	350	10
1969	"	60	210	20
Lone Pine Ridge				
1968	Fesc	75	380	0
1969	"	70	260	0
212				
Sixmile Hill				
1968	Fesc	45	160	40
1969	"	40	240	0
Beilenberg Gulch				
1969	Feid	60	550	0
South America Park				
1968	Fesc	70	200	0
1969	"	50	80	0
Taylor Ridge				
1968	Closest bunchgrass	60	200	15
1969	Fesc	80	120	10
	Feid	64		
	Agst	30		
Robinson Ridge				
1968	Fesc	65	280	0
1969	Fesc	58	380	20

Table 7. (cont'd)

Hunting District Site Year	Species checked	Percent utilization (by grazed plant count)	Pellet groups/acre Elk	 Deer
213				
Modesty Ridge- Exclosure Site				
1969	Fesc	40	10	0
215				
Oro Fino Mtn.				
1969	Agsp	5	70	0
216				
Hogback Point				
1968	Agsp	19	480	0
	Feid	32		
	Fesc	76	460	15
1969	Agsp	20		
	Feid	25		
	Fesc	75		
West Fork Buttes				
1968	Agsp	20	350	10
Stoney Creek				
1968				
Lower site	Agsp	30	150	180
Ridge site	Agsp	80	520	20
Slope site	Agsp	35	100	280
1969				
Lower site	Agsp	10	10	20
Ridge site	Agsp	65	160	0
Slope site	Agsp	60	70	120
Moose Gulch				
1969	Fesc	30	80	140
Quartz Gulch				
1969	Feid	10	110	200
Average sites checked				
1968		51	261	32
1969		42	188	29

Ratio in 1968 - 815 elk:100 deer
Ratio in 1969 - 646 elk:100 deer

Table 8. Browse condition and trend in Deerlodge Unit

Hunting district	Year	No. plots	% severely hedged	Condition class	% leader use	Pellet groups/acre Deer	Elk
210	1960	8	62	V. poor	22	340	0
	1965	10	22	Fair	19	126	3
	1966	10	28	Fair	18	112	10
	1967	8	43	Poor	49	148	12
	1968	7	9	Good	21	103	11
	1969	7	11	Good	33	99	4
211-214	1961	1	80	V. poor	2	40	0
	1965	1	64	V. poor	43	200	0
	1966	1	92	V. poor	41	-	-
	1967	1	64	V. poor	47	130	10
	1969	1	50	V. poor	41	130	0
212	1960	3	58	V. poor	37	107	24
	1965	2	85	V. poor	53	150	15
	1966	4	59	V. poor	31	113	18
	1967	2	66	V. poor	72	520	127
	1968	3	45	Poor	30	115	87
	1969	2	64	V. poor	43	220	25
213	1960	5	72	V. poor	36	103	18
	1965	3	31	Poor	48	160	0
	1966	3	50	Poor	9	65	0
	1967	5	43	Poor	68	160	0
	1968	3	6	Good	23	100	0
	1969	3	3	Excellent	53	103	0
215	1960	2	79	V. poor	86	360	0
	1965	4	88	V. poor	85	395	53
	1966	4	75	V. poor	66	138	0
	1967	5	50	V. poor	78	337	45
	1968	4	37	Poor	62	196	4
	1969	4	42	Poor	65	210	7
216	1967	3	23	Fair	18	96	27
	1968	2	26	Fair	10	75	0
	1969	3	7	Good	14	85	0
Unit average	1960	20	64	V. poor	34	228	21
	1965	20	58	V. poor	50	200	14
	1966	22	61	V. poor	33	107	7
	1967	24	48	Poor	55	176	37
	1968	19	25	Fair	32	118	17
	1969	20	31	Fair	41	140	6

Table 9. Deer hunting regulations 1965-68 in the Deerlodge Unit

Area Year	Dates	Type	Exceptions
210			
1965	Oct. 24-Nov. 28	1 - E.S.	
1966	Oct. 23-Nov. 27	1 - E.S.	
1967	Oct. 22-Nov. 26	1 - E.S.	
1968	Oct. 27-Dec. 1	1 - E.S.	
211			
1965	Oct. 24-Nov. 28	1 - E.S.	
1966	Oct. 23-Nov. 27	1 - E.S.	
1967	Oct. 22-Nov. 26	1 - E.S.	
1968	Oct. 6 - Dec. 1	1 - E.S.	
212			
1965	Oct. 24-Nov. 28	1 - E.S.	
1966	Oct. 23-Nov. 27	1 - E.S.	
1967	Oct. 22-Nov. 26	1 - E.S.	
1968	Oct. 27-Dec. 1	1 - E.S.	
213			
1965	Oct. 24-Nov. 28	1 - E.S.	
1966	Oct. 23-Nov. 27	1 - E.S.	
1967	Oct. 22-Nov. 26	1 - E.S.	
1968	Oct. 27-Dec. 1	1 - E.S.	
214			
1965	Oct. 24-Nov. 28	1 - E.S.	
1966	Oct. 23-Nov. 27	1 - E.S.	
1967	Oct. 22-Nov. 26	1 - E.S.	
1968	Oct. 6 -Dec. 1	1 - E.S.	
215			
1965	Oct. 24-Nov. 28	1 - E.S.	
1966	Oct. 23-Nov. 27	1 - E.S.	
1967	Oct. 22-Nov. 26	1 - E.S.	
1968	Oct. 27-Dec. 1	1 - E.S.	
216*			
1968	Oct. 6-Dec. 1	1 - E.S.	

*Portion of District 210 prior to 1968

Table 10. Elk hunting regulations 1965-1968 in the Deerlodge Unit

Area / Year	Dates	Type	Exceptions
210			
1965	Oct. 24-Nov. 28	E.S.	
1966	Oct. 23-Nov. 27	E.S.	
1967	Oct. 22-Nov. 19	E.S.	
1968	Oct. 27-Nov. 11	E.S.	
	Nov. 12-Dec. 1	Antlered Bulls	
211			
1965	Oct. 24-Nov. 28	E.S.	
1966	Oct. 23-Nov. 27	E.S.	
1967	Oct. 22-Nov. 19	E.S.	
1968	Oct. 6-Dec. 1	E.S.	
212			
1965	Oct. 24-Nov. 28	E.S.	
1966	Oct. 23-Nov. 27	E.S.	
1967	Oct. 22-Nov. 19	E.S.	
1968	Oct. 27-Nov. 11	E.S.	
	Nov. 12-Dec. 1	Antlered Bulls	
213			
1965	Oct. 24-Oct. 26	E.S.	
	Oct. 27-Nov. 28	B. A. Bulls	
1966	Oct. 23-Oct. 25	E.S.	
	Oct. 26-Nov. 27	B. A. Bulls	
1967	Oct. 22-Oct. 24	E.S.	
	Oct. 25-Nov. 19	B. A. Bulls	
1968	Oct. 27-Oct. 29	E.S.	
	Oct. 30-Dec. 1	Antlered Bulls	
214			
1965	Oct. 24-Nov. 28	E.S.	
1966	Oct. 23-Nov. 27	E.S.	
1967	Oct. 22-Nov. 19	E.S.	
1968	Oct. 6-Oct. 29	E.S.	Portion East of Storm Lake road
	Oct. 6-Dec. 1	E.S.	Georgetown-Trout Cr. portion
215			
1965	Oct. 24-Nov. 14	E.S.	
1966	Oct. 23-Nov. 27	E.S.	
1967	Oct. 22-Nov. 12	E.S.	
1968	Oct. 27-Nov. 11	E.S.	
	Nov. 12-Dec. 1	Antlered Bulls	
216			
1968	Oct. 6-Dec. 1	E.S.	

Table 11. Elk harvest in Deerlodge Unit based on hunter questionnaire

Hunting district	Year	Elk harvested by: Res.	Non-res.	Total	Area (sq.mi.)	Kill per sq. mi.	No. hunters	% hunting success
210	1957-60 ave.			92	1060	.08	626	15
	1961-64 ave.	115	7	122	1095	.11	755	16
	1965	127	24	151	1095	.14	581	26
	1966	113	65	178	1095	.16	738	24
	1967	224	14	238	1095	.22	829	29
	1968*	280	54	334	1095	.31	1193	28
	1968	74	27	101	730	.14	546	19
	1965-68* ave.	186	39	225	1095	.21	835	27
	1967-68 ave.			146	1095	.15	739	20
211	1957-60 ave.			101	245	.41	429	24
	1961-64 ave.	57	7	64	245	.26	311	21
	1965	47	0	47	245	.19	165	29
	1966	68	0	68	245	.28	234	29
	1967	59	14	73	245	.30	167	44
	1968	239	14	252	245	1.03	448	56
	1965-68 ave.	103	7	110	245	.45	254	43
	1957-68 ave.			92	245	.38	331	28
212	1957-60 ave.			171	605	.28	844	20
	1961-64 ave.	132	9	141	605	.23	704	26
	1965	177	0	177	605	.29	691	26
	1966	79	16	95	605	.16	552	17
	1967	234	0	234	605	.39	918	26
	1968	245	14	258	605	.43	1003	26
	1965-68 ave.	184	7	191	605	.32	791	24
	1957-68 ave.			168	605	.28	780	22
213	1957-60			38	195	.19	259	15
	1961-64	32	1	33	195	.17	155	21
	1965	35	0	35	195	.18	133	27
	1966	23	0	23	195	.12	95	24
	1967	14	0	14	195	.07	197	7
	1968	11	0	11	195	.06	126	9
	1965-68 ave.	21	0	21	195	.11	138	15
	1957-68 ave.			31	195	.16	184	17
214	1957-60			46	165	.28	254	18
	1961-64	52	0	52	165	.32	239	22
	1965	18	0	18	165	.11	127	14
	1966	60	8	68	165	.41	270	25
	1967	83	0	83	165	.50	346	24
	1968	81	0	81	165	.49	414	20
	1965-68 ave.	61	0	61	165	.37	289	21
	1957-68 ave.			54	165	.33	261	21

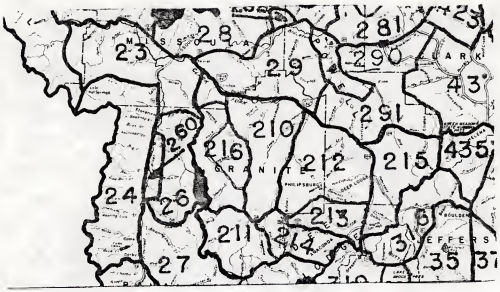

Figure 3. Hunting Districts of the Deerlodge Unit

Table 12. Deer harvest in the Deerlodge Unit based on hunter questionnaire

Hunting district	Year	Deer harvested	Area (sq. mi.)	Kill per sq. mi.	No. hunters	% hunting success
210	1957-60 ave.	809	1060	.76	959	84
	1961-64 ave.	728	1095	.68	1120	65
	1965	277	1095	.25	624	44
	1966	481	1095	.44	813	59
	1967	571	1095	.52	831	69
	1968*	849	1095	.78	1406	59
	1968	403	730	.55	685	59
	1965-68 ave.*	545	1095	.50	918	59
	1957-68 ave.	694	1095	.63	1000	69
211	1957-60 ave.	166	245	.68	291	57
	1961-64 ave.	96	245	.39	176	56
	1965	38	245	.16	58	65
	1966	45	245	.18	102	45
	1967	66	245	.27	118	56
	1968	163	245	.67	214	76
	1965-68 ave.	78	245	.32	123	63
	1957-68 ave.	113	245	.46	197	57
212	1957-60 ave.	319	605	.53	603	53
	1961-64 ave.	289	605	.48	548	53
	1965	172	605	.28	449	38
	1966	171	605	.28	408	42
	1967	433	605	.72	685	63
	1968	436	605	.72	801	54
	1965-68 ave.	303	605	.50	586	52
	1957-68 ave.	304	605	.50	579	53
213	1957-60 ave.	182	195	.93	322	57
	1961-64 ave.	59	195	.30	167	35
	1965	78	195	.40	196	40
	1966	56	195	.29	98	57
	1967	144	195	.74	245	59
	1968	54	195	.28	184	30
	1965-68 ave.	83	195	.43	181	46
	1957-68 ave.	108	195	.43	223	48
214	1957-60 ave.	106	165	.64	223	48
	1961-64 ave.	84	165	.51	191	44
	1965	75	165	.45	262	29
	1966	131	165	.79	187	70
	1967	132	165	.80	314	42
	1968	112	165	.68	385	29
	1965-68 ave.	113	165	.68	287	39
	1957-68 ave.	101	165	.61	234	43

Table 11 (cont'd)

Hunting district	Year	Elk harvested by: Res.	Non-res.	Total	Area (sq.mi.)	Kill per sq. mi.	No. hunters	% hunting success
215	1957-60			177	435	.41	840	21
	1961-64	114	10	124	435	.29	743	17
	1965	38	0	38	435	.09	437	9
	1966	57	8	65	435	.15	321	20
	1967	130	0	130	435	.30	621	21
	1968	151	0	151	435	.35	749	20
	1965-68 ave.	94	2	96	435	.22	532	18
	1957-68 ave.			132	435	.30		
216	1968	206	27	233	365	.64	647	36
Deerlodge Unit								
	1957-60 ave.			625	2705	.23	3207	20
	1961-64 ave.			538	2740	.20	2909	19
	1965	442	24	466	2740	.17	2134	22
	1966	400	97	497	2740	.18	2210	23
	1967	744	28	772	2740	.28	3078	25
	1968	1007	82	1089	2740	.40	3184	34
	1965-68 ave.	648	58	706	2740	.26	2652	27
	1957-68 ave.			623	2740	.23	2923	21
Rock Creek Area (210, 211, & 216)								
	1957-60 ave.			242	1305	.19	1055	23
	1961-64 ave.			186	1340	.14	1066	17
	1965	174	24	198	1340	.15	746	27
	1966	181	65	246	1340	.18	972	25
	1967	283	28	311	1340	.23	996	31
	1968	519	68	587	1340	.44	1641	36
	1965-68 ave.	289	46	336	1340	.25	1089	31
	1957-68 ave.			255	1340	.19	1070	24
Flint Range (Areas 212 and 213)								
	1954-56 ave.			510	800	.64		
	1957-60 ave.			209	800	.26	1103	19
	1961-64 ave.			175	800	.22	859	20
	1965	212	0	212	800	.27	824	26
	1966	102	16	118	800	.15	647	18
	1967	248	0	248	800	.31	1115	22
	1968	256	14	270	800	.34	1129	24
	1965-68 ave.	205	8	213	800	.27	929	23
	1957-68 ave.			199	800	.25	964	21

*Includes H.U. 216 which was split out in 1968

Table 12. (cont'd)

Hunting district	Year	Deer harvested	Area (sq. mi.)	Kill per sq. mi.	No. hunters	% hunting success
215	1967-60 ave.	215	435	.49	418	51
	1961-64 ave.	194	435	.45	390	50
	1965	84	435	.19	220	38
	1966	169	435	.39	350	48
	1967	168	435	.39	405	42
	1968	380	435	.87	681	56
	1965-68 ave.	200	435	.46	414	48
	1957-68 ave.	203	435	.47	407	50
216	1968	446	365	1.22	721	62
Deerlodge Unit						
	1957-60 ave.	1907	2705	.71	2817	68
	1961-64 ave.	1447	2740	.53	2591	56
	1965	724	2740	.26	1809	40
	1966	1053	2740	.38	1958	54
	1967	1514	2740	.55	2598	58
	1968	1994	2740	.73	3671	54
	1965-68 ave.	1321	2740	.48	2509	53
	1957-68 ave.	1523	2740	.56	2640	58
Upper Rock Creek (Areas 211 & 214)						
	1957-60 ave.	272	410	.66	514	53
	1961-64 ave.	180	410	.44	367	49
	1965	113	410	.28	320	35
	1966	176	410	.43	289	61
	1967	198	410	.48	432	46
	1968	275	410	.67	599	46
	1965-68 ave.	191	410	.47	410	47
	1957-68 ave.	214	410	.52	431	50
Flint Range (Areas 212 & 213)						
	1957-60 ave.	501	800	.63	925	54
	1961-64 ave.	348	800	.44	715	49
	1965	250	800	.31	645	39
	1966	227	800	.28	506	45
	1967	577	800	.72	930	62
	1968	490	800	.61	985	50
	1965-68 ave.	386	800	.48	767	50
	1957-68 ave.	412	800	.52	802	51

*Includes area 216 which was formed by splitting original area 210

Table 13. Elk and deer harvest ratios based on questionnaire returns

Area	Year	% antlered deer	Elk	
			Bulls:100 cows	Calves:100 cows
210	1956-60 ave.	52	121	42
	1961-64 ave.	65	222	51
	1965	70	114	18
	1966	77	162	78
	1967	60	132	21
	1968	78	145	28
211	1956-60 ave.	51	149	38
	1961-64 ave.	64	91	73
	1965	46	161	-
	1966	68	196	-
	1967	41	130	140
	1968	55	98	43
212	1956-60 ave.	44	86	32
	1961-64 ave.	57	140	70
	1965	62	71	
	1966	64	46	
	1967	57	62	
	1968	56	171	57
213	1956-60 ave.	44	85	64
	1961-64 ave.	72	122	-
	1965	88	200	100
	1966	60	100	
	1967	84	-	
	1968			
214	1956-60 ave.	56	47	58
	1961-64 ave.	52	46	46
	1965	35	100	-
	1966	79	65	32
	1967	68	100	100
	1968	35	109	33
215	1956-60 ave.	53	76	44
	1961-64 ave.	62	201	106
	1965	80	225	-
	1966	73	35	74
	1967	85	115	68
	1968	70	145	21
Deerlodge Unit				
	1956-60 ave.	52	97	43
	1961-64 ave.	61	115	49
	1965	67	109	19
	1966	74	98	48
	1967	65	105	54
	1968	67	135	40
	1965-68 ave.	68	112	40

Table 14. Mountain goat special permit hunting in the Deerlodge Unit

Hunting Dist. Year	Number permits	No. that hunted	Goats killed	Percent success	Sex killed Male	Female
212- N. Flint Range						
1956-1963 total	70	60	26	43	18	8
1964	10	10	2	20	2	0
1965	10	10	3	30	2	1
1966	10	6	2	40	2	0
1967	5	5	1	25	1	0
1968	10	9	5	57	5	0
1964-1968 total	45	40	13	33	12	1
213-S. Flint Range						
1956-1963 total	26	25	22	88	11	11
1964	3	3	2	67	2	1
1965	3	3	0	0	0	0
1966	3	3	2	66	0	2
1967	0					
1968	0					
222- Mill Creek-Pintlar						
1956-1963	330	281	170	61	83	81
1964	45	37	24	65	9	15
1965	45	36	25	69	12	13
1966	45	38	27	72	19	8
1967	45	38	24	62	15	9
1968	45	44	23	53	15	6
1964-1968 total	225	193	123	64	70	51
261- Sapphire Range						
1964	5	5	4	80	3	0
1965	4	3	2	67	0	2
1966	5	3	3	100	2	1
1967	5	5	3	60	1	1
1968	5	5	5	100	2	3
1964-68 total	24	21	17	81	8	7

Table 15. Reported location of mountain goats killed in Deerlodge Unit

Hunting Unit Drainage or landmark	Number 1956-60	Number 1961-64	1965	1966	1967	1968
212						
Dempsey Cr.-Mt. Powell	3	2	1	1	0	2
Racetrack Cr.-Racetrack Pk.	4	3	1	0	1	1
Rock Cr.-Goat Mtns.	6	4	0	0	1	1
Boulder Cr.-Finley Basin	3	1	0	1	0	0
213						
Lost Creek-Lost Cr. Falls	16	5	0	1	-	-
222						
Mill Cr.-Mill Divide	3	7	5	3	4	2
Barker Cr.-Mt. Haggin	4	8	4	4	4	3
Nelson Cr.-Barker Divide	2	9	1	2	2	0
Twin Lakes Cr.-Mt. Howe	0	4	4	1	1	5
Storm Lake Cr.-Mt. Tiny	0	1		1	1	0
Seymour Cr.-Seymour Lake	5	2		0	1	1
Page Cr.-Goat Flats	18	9	2	4	0	2
E. Fk. Rock Cr.-Rainbow Mtn.	10	10	2	3	4	2
Carp Creek-Mt. Warren	5	4	0	1	0	0
Edith Lake-McGlauglin Pk.	4	2	0	1	1	0
Falls Cr.-E. Pintlar Pk.	7	9	0	2	2	0
Middle Fk. Rock Cr.-W. Pintlar Pk.	2	4	0	0	0	0
Fishtrap Creek-Goat Pks.	0	6	2	1	1	1
Thompson Cr.-Lion Lake	0	3	0	0	0	0
Pintlar Creek	0	0	1	0	0	0
LaMarche Creek	0	0	1	0	0	1
261						
Stoney Cr.-Dome Shaped Mtn			2	3	3	4

Table 16. Moose special permit hunting in the Deerlodge Unit

Hunting District Year	Number permits	Reported killed	% success	Sex and age harvested Bulls	Cows	Calves
210-Lower Rock-Willow						
1956-63	104	85	82	45	40	5
1964	20	16	80	10	5	1
1965	20	10	50	5	3	0
1966	20	19	95	13	4	2
1967	25	20	80	10	10	0
1968	25	20	80	8	10	2
1964-68	110	85	77	46	32	5
211-Upper Rock Creek						
1956-1963	150	130	87	56	54	12
1964	15	11	90	6	3	0
1965	15	7	45	2	3	0
1966	15	10	67	7	2	0
1967	20	16	80	10	6	1
1968	20	16	84	9	6	1
1964-1968	85	60	71	34	20	2
212-Flint Range						
1956-1963	110	90	82	49	37	12
1964	15	12	80	4	6	1
1965	15	10	67	5	4	2
1966	15	15	100	8	6	0
1967	20	10	50	6	4	2
1968	20	13	65	7	6	0
1964-1968	85	60	71	30	26	5
214-Mill Cr.-Georgetown						
1957-1963	27	26	96	14	12	4
1964	5	5	100	3	2	0
1965	5	5	100	3	2	0
1966	5	5	100	0	5	1
1967	10	7	70	6	1	1
1968	10	10	100	6	4	0
1964-68	35	32	91	18	14	2

Table 17. Reported location of moose kills in the Deerlodge Unit

Hunting District Drainage	Number 1956-60	Number 1961-64	1965	1966	1967	1968	Number 1965-68
210							
Rock Cr. Bottoms	5	29	2	5	4	7	18
Brewster Cr.	0	4	1	1	0	0	2
Ranch Cr.	0	2	1	0	1	2	4
Hogback Cr.	0	1	0	1	1	0	2
Butte Cabin	0	1	0	1	0	0	1
W. Fk. Rock Cr.	0	1	1	1	0	0	2
Stoney Creek	0	1	0	0	0	0	0
Schwartz Cr.	0	1	0	0	2	0	2
Spring Cr.	0	3	0	1	1	0	2
Lower Willow	6	5	2	0	2	0	4
Hendersen-Smart Cr.	3	2	0	0	0	0	0
Upper Willow	5	10	1	4	6	7	18
Tyler Cr.	1	1	0	1	0	0	1
Marshall Cr.	0	1	0	0	1	0	1
211							
Middle Fork Rock	2	13	0	3	4	8	15
Copper Cr.	2	10	1	2	2	0	5
Meadow Cr.	1	4	0	1	0	1	2
East Fork Rock	0	2	0	0	0	0	0
Ross Fk. Bottoms	11	8	1	2	3	1	7
W. Fk. Rock	19	8	2	0	2	4	8
Upper Ross Fork	7	9	0	2	4	2	8
212							
Gold Cr.	12	13	0	0	1	2	3
Blum Cr.	1	0	0	0	0	0	0
Willow Cr.	1	1	0	1	0	0	1
Rock Cr.	4	8	1	3	4	1	9
Prison Ranch-Tincup	12	4	0	0	2	0	2
Dempsey	2	1	0	0	0	0	0
Racetrack Cr.	9	4	2	2	1	2	7
Red Lion	2	2	2	2	1	1	6
Fred Burr-Rumsy	0	6	1	0	0	2	3
Boulder Cr.	2	4	0	1	0	2	3
Douglas Cr.	1	1	0	0	0	1	1
Dingwall-Wallace Ranch area	1	2	3	3	0	1	7
Lost Creek	1	-	-	-	-	-	-
214							
Mill Creek	10	11	2	2	5	6	15
Clear Creek	0	1	2	0	1	1	4
Greys Gul.	0	3	1	0	1	0	2
Storm Lake Cr.	0	3	1	0	0	0	1
Warm Springs Cr.	0	0	0	0	0	3	3